

CONTENTS

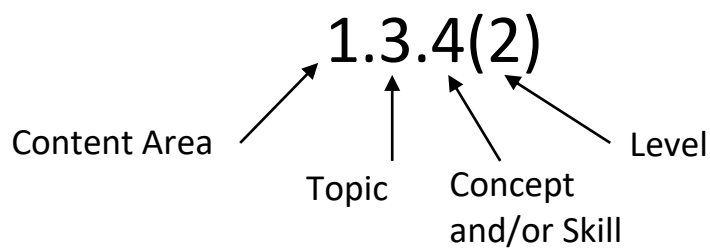
Abbreviations used:	i
1. NUMBERS, OPERATIONS AND RELATIONSHIPS	1
1.1. Whole numbers	1
1.1.1. Mental calculations	1
1.1.2. Counting, ordering, comparing and representing, and place value of digits	1
1.1.3. Calculation techniques	13
1.1.4. Multiples and factors.....	24
1.1.5. Properties of whole numbers	28
1.1.6. Solving problems involving whole numbers.....	31
1.2. Common fractions	35
1.2.1. Describing and ordering fractions	35
1.2.2. Calculations with fractions	42
1.2.3. Solving problems	45
1.2.4. Percentages	48
1.2.5. Equivalent forms.....	49
1.3. Decimal fractions	54
1.3.1. Recognising, ordering and place value of decimal fractions	54
1.3.2. Calculations with decimal fractions.....	57
1.3.3. Solving problems	59
1.3.4. Equivalent forms.....	60
2. Patterns, Functions and Algebra	62
2.1. Numeric Patterns	62
2.1.1. Investigate and extend patterns.....	62
2.1.2. Input and output values	66
2.1.3. Equivalent forms.....	75
2.2. Geometric Patterns.....	83
2.2.1. Investigate and extend patterns.....	83
2.2.2. Input and output values	83
2.2.3. Equivalent forms.....	83
2.3. Number sentences.....	96
2.3.1. Number sentences.....	96
3. Space and Shape (Geometry).....	100

3.1	Properties of 2-D Shapes	100
3.1.1	Characteristics of shapes	100
3.1.2	Further activities.....	116
3.1.3	Angles	124
3.2	Properties of 3-D Objects	127
3.2.1	Characteristics of Objects.....	127
3.2.2	Further activities.....	138
3.3	Symmetry.....	141
3.3.1	Symmetry.....	141
3.4	Transformations.....	147
3.4.1	Build composite shapes – Assessed practically	147
3.4.2	Tessellations – Assessed practically	147
3.4.3	Enlargements and reductions.....	150
3.5	Viewing of Objects	152
3.5.1	Positions and views	152
3.6	Position and Movement	161
3.6.1	Location and directions	161
4	Measurement.....	168
4.1	Length	168
4.1.1	Practical measuring - PRACTICAL.....	168
4.1.2	Measuring instruments.....	168
4.1.3	Units.....	168
4.1.4	Calculations and problem-solving involving length.....	180
4.2	Mass.....	188
4.2.1	Practical Measuring – PRACTICAL.....	188
4.2.2	Measuring instruments	188
4.2.3	Units.....	188
4.2.4	Calculations and problem solving.....	194
4.3	Capacity / Volume.....	204
4.3.1	Practical Measuring - PRACTICAL	204
4.3.2	Measuring instruments	204
4.3.3	Units.....	204
4.3.4	Calculations and problem solving.....	204
4.3.4	More calculations and problem solving	217
4.4	Time	221

4.4.1	Reading time and time instruments	221
4.4.2	Reading calendars.....	227
4.4.3	Calculations and problem solving.....	230
4.4.4	History of time	242
4.5	Temperature	243
4.5.1	Practical measuring - PRACTICAL.....	243
4.5.2	Measuring instruments	243
4.5.3	Units.....	243
4.5.4	Calculations and problem-solving involving temperature	248
4.6	Perimeter, surface area and volume	251
4.6.1	Perimeter – PRACTICAL in Grades 4 - 6	251
4.6.2	Measuring area.....	252
4.6.3	Measurement of volume – PRACTICAL	256
4.6.4	Investigate – ASSESSED BY INVESTIGATION	256
4.7	History of measurement.....	256
4.7.1	History of measurement - ASSESSED BY PROJECT.....	256
5.	Data Handling.....	257
5.1	Collecting and Organising Data.....	257
5.2	Representing Data	268
5.3	Analysing, Interpreting and Reporting Data	285
5.4	Probability.....	312

LEVEL						
	1	2	3	4	5	6
Grade 4	Knowledge	Routine Procedure	Complex Procedures	Problem Solving		
Grade 5		Knowledge	Routine Procedure	Complex Procedures	Problem Solving	
Grade 6			Knowledge	Routine Procedure	Complex Procedures	Problem Solving

ABBREVIATIONS USED:



1. NUMBERS, OPERATIONS AND RELATIONSHIPS

1.1. Whole numbers

1.1.1. Mental calculations

1.1.2. Counting, ordering, comparing and representing, and place value of digits

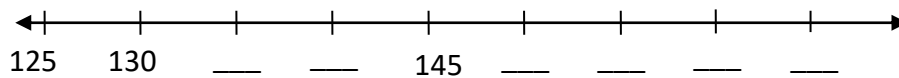
1.1.2(1) a. How many stars?



()

b. Count and complete:

21 ; 22 ; 23 ; ____ ; ____ ; ____ ; ____



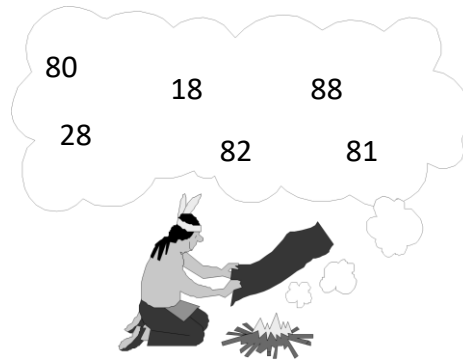
()

c. Write the matching number names or numbers.

401	_____
_____	five hundred and fifty-six
780	_____
_____	nine hundred and twenty-seven

()

d. Arrange these numbers from the smallest to the largest.



()

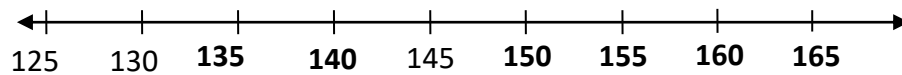
e. Complete.

- $53 = 50$ and ____
- $48 =$ ____ and 8
- 90 and $2 =$ ____

()

Memo a. 25

b. 21 ; 22 ; 23 ; **24** ; **25** ; **26** ; **27**



c.

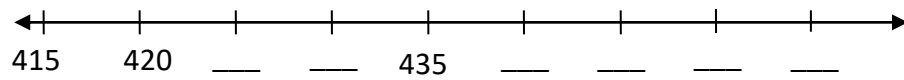
401	Four hundred and one
556	five hundred and fifty-six
780	Seven hundred and eighty
627	nine hundred and twenty-seven

d. 18; 28; 80; 81; 82; 88

e. $53 = 50$ and **3** ; $48 =$ **40** and 8 ; 90 and $2 =$ **92**

1.1.2(2) a. Count and complete:

225 ; 325 ; 425 ; ____ ; ____ ; ____ ; ____



()

b. Write these numbers in ascending order.



()

c. Write the matching number names or numbers.

3 401	_____
_____	eight thousand, five hundred and fifty-six
7 080	_____
_____	nine thousand and twenty-seven

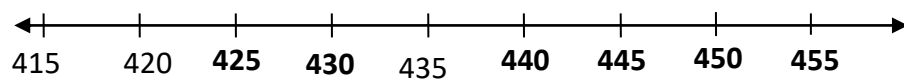
()

d. Complete.

- $343 = 300 + \underline{\quad} + 3$
- $502 = \underline{\quad} + 2$
- $400 + \underline{\quad} + \underline{\quad} = 476$
- $\underline{\quad} + \underline{\quad} + \underline{\quad} = 799$

()

Memo: a. 225 ; 325 ; 425 ; **525** ; **625** ; **725** ; **825**



b. 197; 907; 970; 971; 977

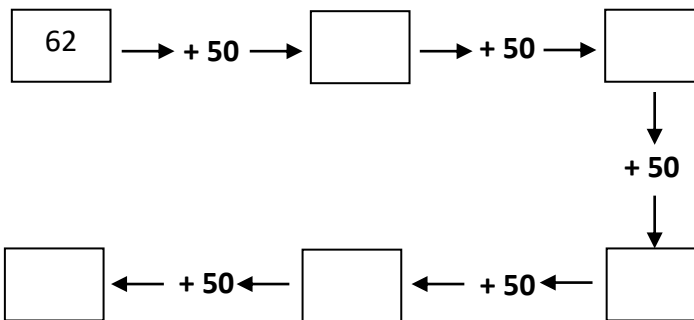
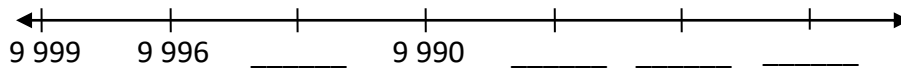
c.

3 401	Three thousand, four hundred and one
8 556	Eight thousand, five hundred and fifty-six
7 080	Seven thousand and eighty
9 027	nine thousand and twenty-seven

d. $343 = 300 + 40 + 3$; $502 = 500 + 2$; $400 + 70 + 6 = 476$;
 $700 + 90 + 9 = 799$

1.1.2(3) a. Count and complete:

1 050 ; 1 075 ; 1 100 ; _____ ; _____ ; _____ ; _____



()

b. Circle the largest number in each row.

3 033	3 303	3 330	1 666	3 111
999	9 900	9 009	9 999	9 000
2 000	555	4 000	4 004	4 400

()

c. Fill in the correct sign $<$, $>$ or $=$.

54 ☐ 45

567 ☐ 576

7 707 ☐ 7 077

()

d. Write the missing numbers in each box.

$$2\ 354 = 2\ 000 + 300 + \boxed{} + 4$$

$$4\ 798 = \boxed{} + 700 + 90 + 8$$

$$5\ 555 = 5\ 000 + \boxed{} + 50 + 5$$

What does the digit 8 represent in 6 378? ____

What does the digit 4 represent in 7 415? ____

()

e. What is the value of each of the underlined digits?

3 83

4 205

6 897

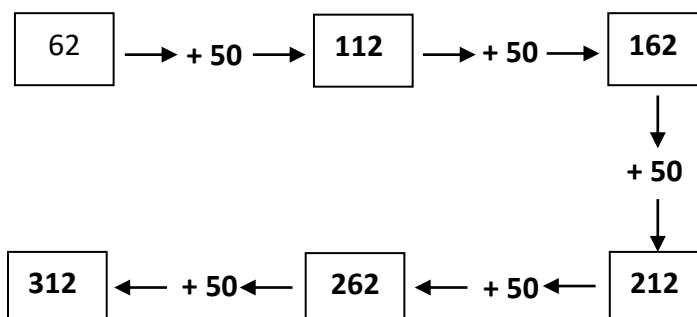
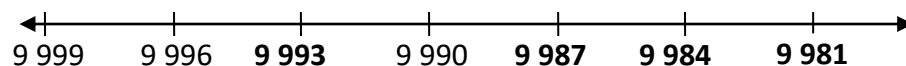
()

f. Complete. Round to the nearest:

	10	100	1 000
2 654			
8 415			
1 969			

()

Memo: a. 1 050 ; 1 075 ; 1 100 ; **1 125** ; **1 150** ; **1 175** ; **1 200**



b.

3 033	3 303	3 330	1 666	3 111
999	9 900	9 009	9 999	9 000
2 000	555	4 000	4 004	4 400

c. 54 > 45

567 < 576

7 707 > 7 077

d.

$$2\ 354 = 2\ 000 + 300 + \boxed{50} + 4$$

$$4\ 798 = \boxed{4\ 000} + 700 + 90 + 8$$

$$5\ 555 = 5\ 000 + \boxed{500} + 50 + 5$$

8 or 8 units; 400 or 4 hundreds

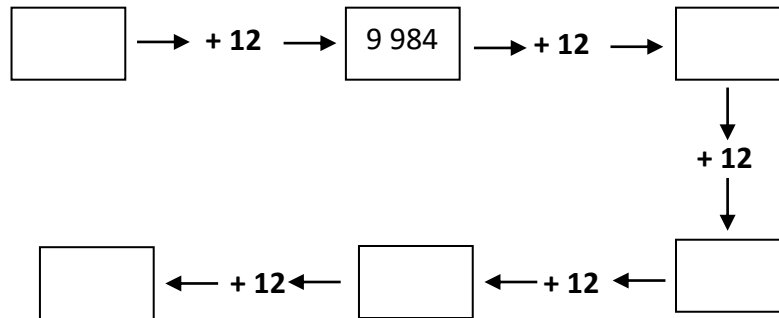
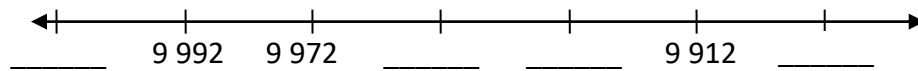
e. 3 83 → 90 or 9 tens, 4 205 → 4 000 or 4 thousands, 6 897 → 800 or 8 hundreds

f.

	10	100	1 000
2 654	2 650	2 700	3 000
8 415	8 420	8 400	8 000
1 969	1 970	2 000	2 000

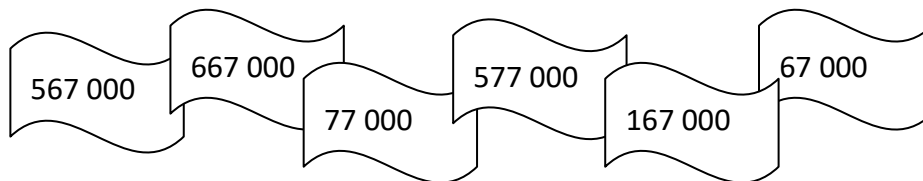
1.1.2(4) a. Count and complete:

1 050 ; 5 075 ; 9 100 ; _____ ; _____ ; _____ ; _____



()

b. Arrange the numbers in ascending order.



()

c. Fill in the correct sign: < , > or =.

10 648 □ 16 480

505 000 □ 78 700

9 999 □ 8 000 000

7 070 070 □ 7 707 070

()

d. Complete.

761 = 700 + _____ + 1

2 025 = 2 000 + _____ + 5

2 980 501 = 2 000 000 + _____ + 80 000 + _____ + _____

()

e. What is the value of each of the underlined digits?

3 893

41 205

652 897

6 970 105

()

f. What is the next even number after 144?

What is the next odd number after 671?

What is the next even number after 235?

What is the even number that is before 659?

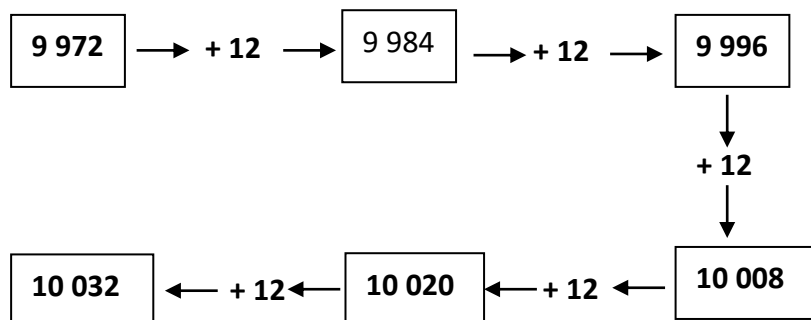
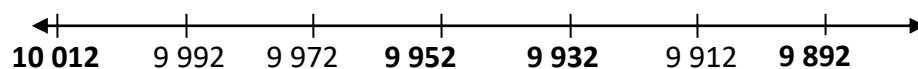
()

g. Complete. Round to the nearest:

	10	100	1 000	5
2 654				
8 462				
6 999				

()

Memo: a. 1 050 ; 5 075 ; 9 100 ; **13 125** ; **17 150** ; **21 175** ; **25 200**



b. 67 000; 77 000; 167 000; 567 000; 577 000; 667 000

c. 10 648 < 16 480; 505 000 > 78 700; 9 999 < 8 000 000;
7 070 070 < 7 707 070

d. $761 = 700 + \mathbf{60} + 1$

$2\ 025 = 2\ 000 + \mathbf{20} + 5$

$2\ 980\ 501 = 2\ 000\ 000 + \mathbf{900\ 000} + 80\ 000 + \mathbf{500} + 1$

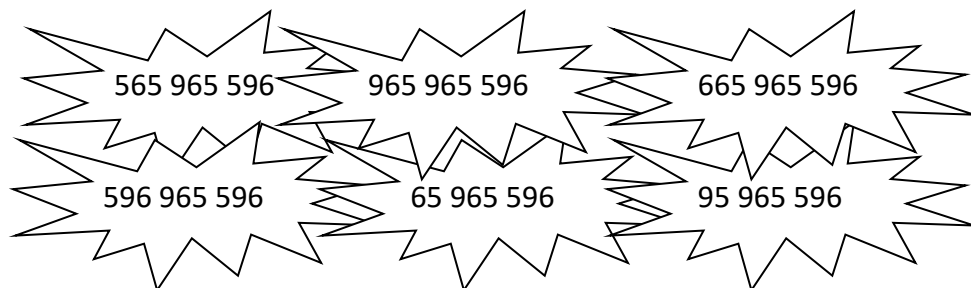
e. 9 tens or 90; 4 ten thousands or 40 000; 8 hundreds or 800;
9 hundred thousands or 900 000

f. 146; 673; 236; 658

g.

	10	100	1 000	5
2 654	2 650	2 700	3 000	2 655
8 462	8 460	8 500	8 000	8 460
6 999	7 000	7 000	7 000	7 000

1.1.2(5) a. Arrange the numbers in ascending order.



()

b. Fill in the correct sign: < , > or =.

$64\ 800 \square 6\ 840$

$555\ 000\ 000 \square 770\ 000$

$9\ 999\ 000 \square 80\ 000\ 000$

$700\ 070\ 070 \square 77\ 707\ 070$

()

c. What is the value of each of the underlined digits?

1 530 893

359 141 205

528 976 520

106 970 105

()

d. Complete.

$$761\,348 = 700\,000 + \underline{\hspace{1cm}} + 1\,000 + \underline{\hspace{1cm}} + 40 + \underline{\hspace{1cm}}$$

$$210\,025 = 200\,000 + \underline{\hspace{1cm}} + \underline{\hspace{1cm}} + 5$$

$$560\,980\,501 = \underline{\hspace{1cm}} + 60\,000\,000 + \underline{\hspace{1cm}} + 80\,000 + \underline{\hspace{1cm}} + \underline{\hspace{1cm}} \quad ()$$

e. Complete. Round to the nearest:

	100	1 000	1 000 000	5
2 254 659				
87 466 612				
146 999 444				
416 089 321				

()

f. i) What is the smallest prime number?

ii) What prime numbers lie between 15 and 20?

iii) Circle all the prime numbers in this table:

71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90

()

Memo: a. 65 965 596 ; 95 965 596 ; 565 965 596 ; 596 965 596 ; 665 965 596 ; 965 965 596

b. $64\,800 > 6\,840$; $555\,000\,000 > 770\,000$; $9\,999\,000 < 80\,000\,000$; $700\,070\,070 > 77\,707\,070$

c. 90 or 9 tens; 40 000 or 40 thousand; 8 000 000 or 8 million; 9 000 000 or 900 thousand or 9 hundred thousand

d. $761\,348 = 700\,000 + \mathbf{60\,000} + 1\,000 + \mathbf{300} + 40 + \mathbf{8}$

$$210\,025 = 200\,000 + \mathbf{10\,000} + \mathbf{20} + 5$$

$$560\,980\,501 = \mathbf{500\,000\,000} + 60\,000\,000 + \mathbf{900\,000} + 80\,000 + \mathbf{500} + \mathbf{1}$$

e.

	100	1 000	1 000 000	5
2 254 659	2 254 700	2 255 000	2 000 000	2 254 660
87 466 612	87 466 600	87 467 000	87 000 000	87 466 610
146 999 444	146 999 400	147 000 000	147 000 000	146 999 445
416 089 321	416 089 300	416 089 000	416 000 000	416 089 320

f. i) 2

ii) 17 and 19

71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90

1.1.2(6) a. Write the following numbers in ascending order.

416 789 325	461 789 325	46 178 325	879 123 456
98 347 125	897 123 654	416 897 235	461 789 352

()

b. Fill in the correct sign: < , > or =.

1 234 800 ☐ Eight hundred and fifty-seven thousand, nine hundred and fifty-seven

123 456 789 ☐ 90 million, four hundred and two

Six hundred million ☐ 600 000 000

9 999 087 ☐ Two hundred and fifteen million, five hundred and forty-three thousand, two hundred and ninety-eight

()

c. Complete. Round to the nearest:

	10	1 000	100 000	5
2 654 159				
81 462 683				
16 999 111				
456 789 106				

()

Memo: a. 897 123 654; 879 123 456; 461 789 352; 461 789 325; 416 897 235;
416 789 325; 98 347 125; 46 178 325

b. 1 234 800 > Eight hundred and fifty-seven thousand, nine
hundred and fifty-seven

123 456 789 > 90 million, four hundred and two

Six hundred million = 600 000 000

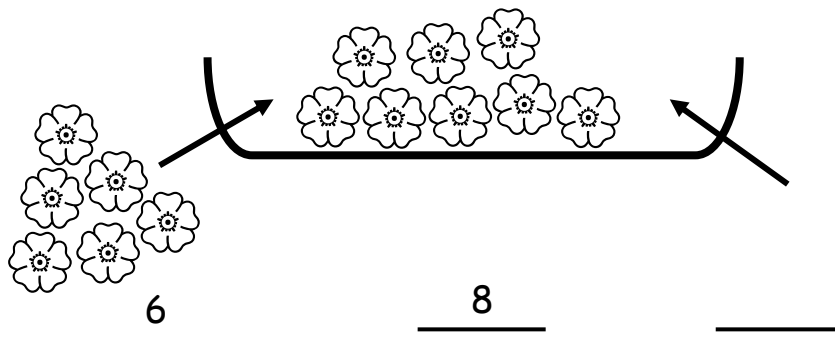
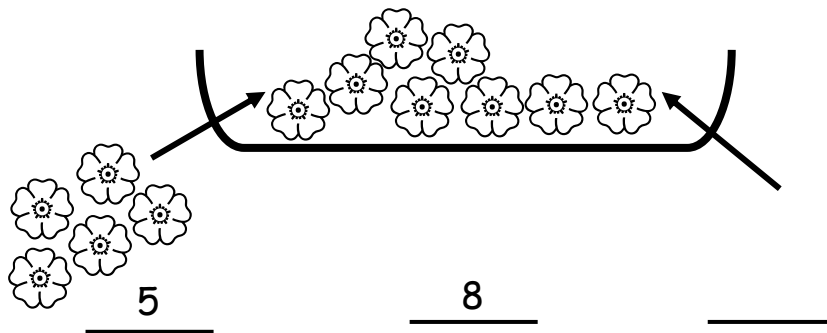
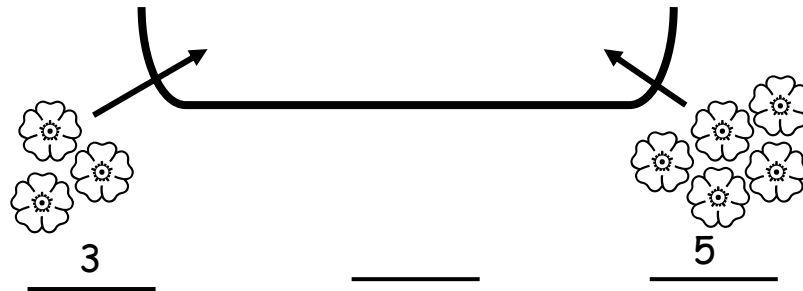
9 999 087 < Two hundred and fifteen million, five
hundred and forty-three thousand, two
hundred and ninety-eight

c.

	10	1 000	100 000	5
2 654 159	2 654 160	2 654 000	2 700 000	265 160
81 462 683	81 462 680	81 463 000	81 500 000	81 462 685
16 999 111	16 999 110	16 999 000	17 000 000	16 999 110
456 789 106	456 789 110	456 789 000	457 000 000	456 789 105

1.1.3 Calculation techniques

1.1.3(1) a. Complete the picture. Write the numbers.



()

b. Make the sides equal.

$$24 + \underline{\quad} + \underline{\quad} = 40$$

$$25 + \underline{\quad} + \underline{\quad} = 40$$

$$26 + \underline{\quad} + \underline{\quad} = 40$$

$$27 + \underline{\quad} + \underline{\quad} = 40$$

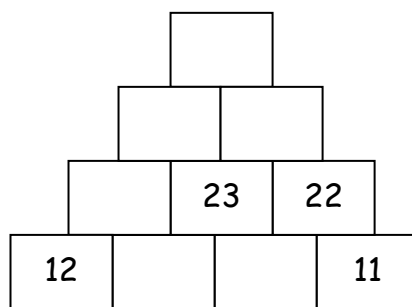
$$28 + \underline{\quad} + \underline{\quad} = 40$$

$$29 + \underline{\quad} + \underline{\quad} = 40$$

()

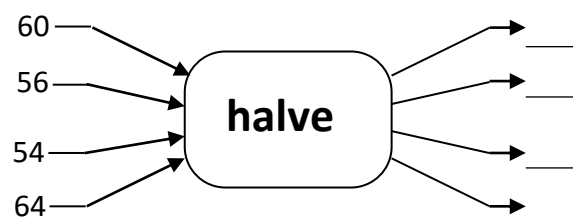
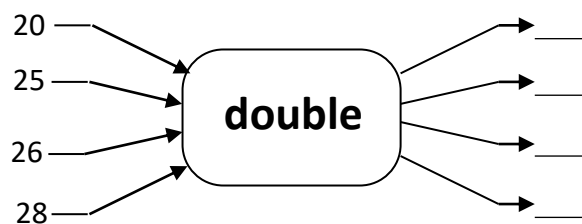
c. Add the two numbers next to each other to get the number above it.

Complete:



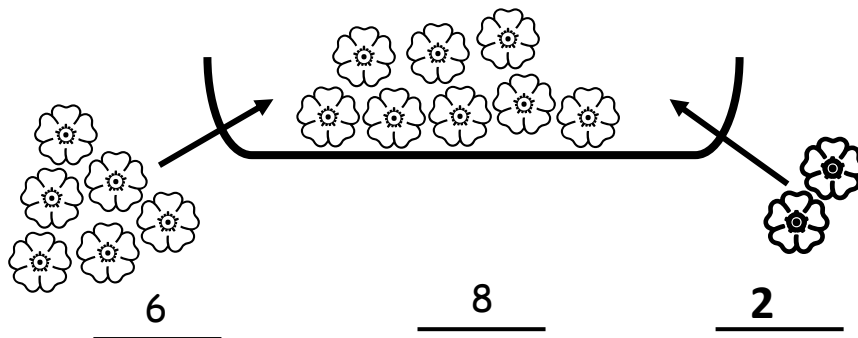
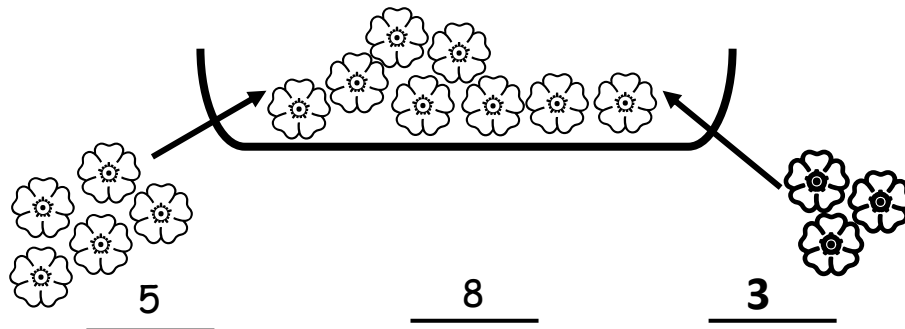
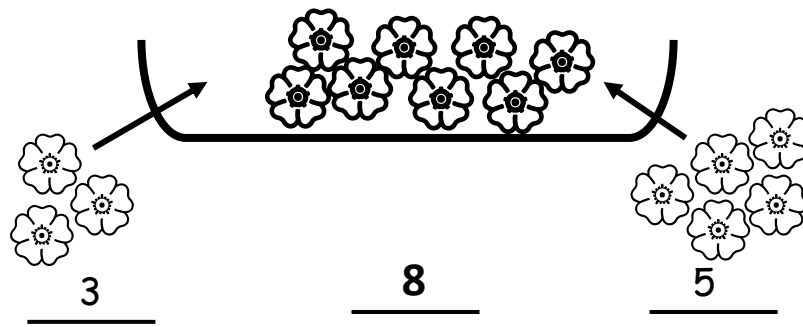
()

d. Complete:



()

Memo: a.



- b. *There are several possible answers for this question, but it is meant to encourage learners to complete the 10.*

$$24 + 6 + 10 = 40$$

$$25 + 5 + 10 = 40$$

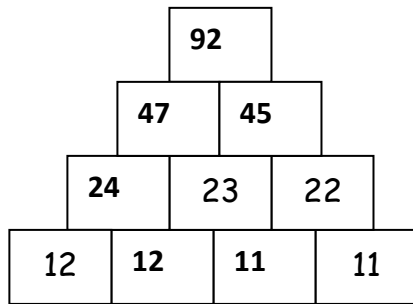
$$26 + 4 + 10 = 40$$

$$27 + 3 + 10 = 40$$

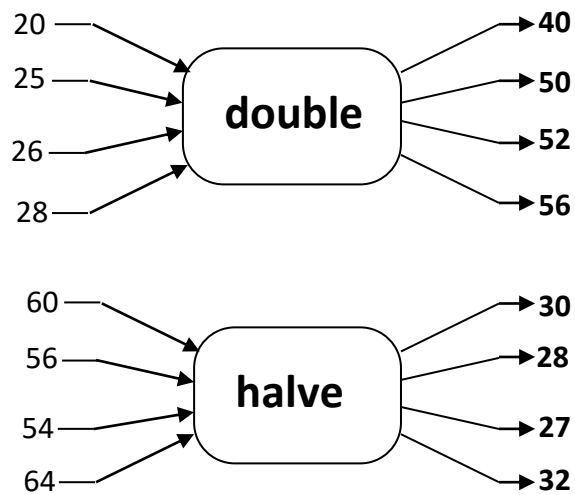
$$28 + 2 + 10 = 40$$

$$29 + 1 + 10 = 40$$

c.



d.



1.1.3(2) a. Make the sides equal.

$$140 + \underline{\hspace{2cm}} = 184$$

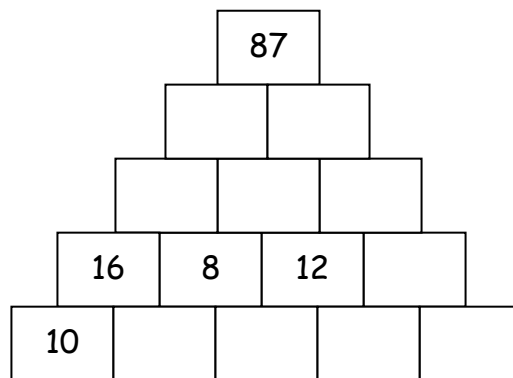
$$140 + \underline{\hspace{2cm}} = 176$$

$$140 + \underline{\hspace{2cm}} = 187$$

$$150 + \underline{\hspace{2cm}} = 196$$

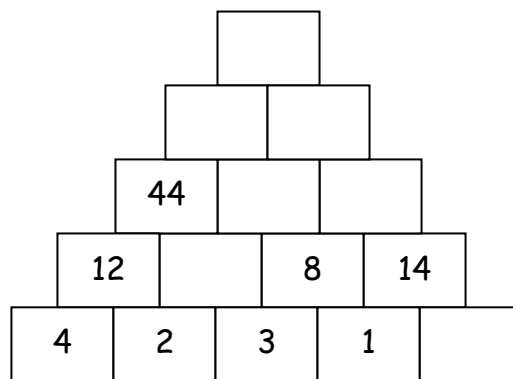
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- b. In this pyramid you add the two numbers next to each other to get the number on top. Complete.



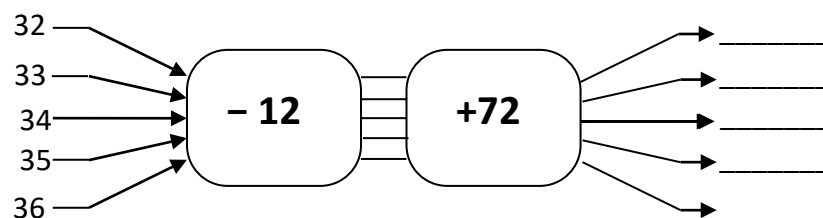
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- c. Work out the rule and complete.



()

- d. Complete. (*Make a plan before you start*)



()

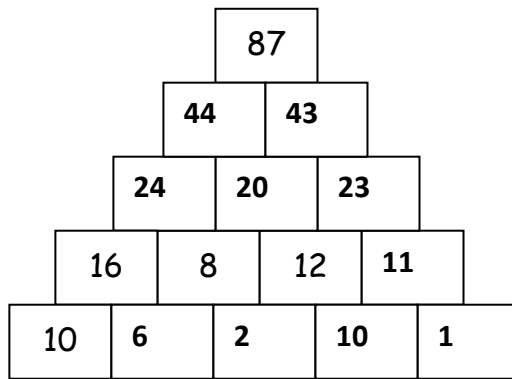
Memo: a. $140 + 44 = 184$

$$140 + 36 = 176$$

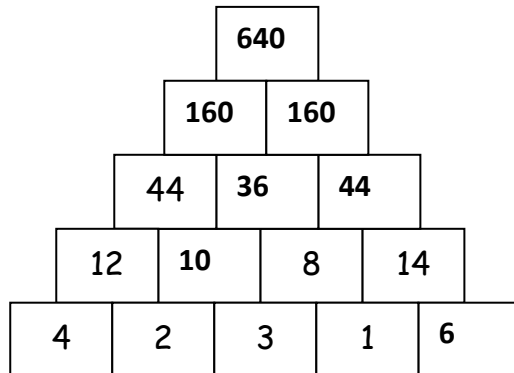
$$140 + 47 = 187$$

$$150 + 46 = 196$$

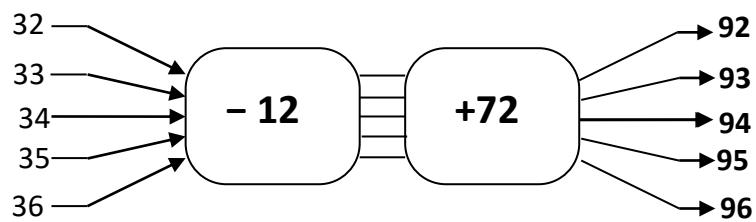
b.



c.



d.



1.1.3(3) a. Use “multiplying by 20” and “compensating” strategies to calculate:

$$3 \times 21 = \underline{\hspace{2cm}}$$

$$22 \times 4 = \underline{\hspace{2cm}}$$

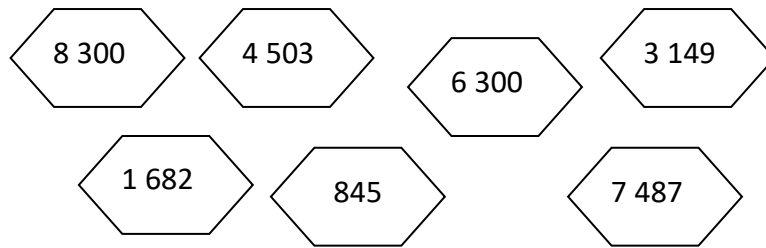
$$19 \times 5 = \underline{\hspace{2cm}}$$

$$22 \times 6 = \underline{\hspace{2cm}}$$

$$19 \times 9 = \underline{\hspace{2cm}}$$

()

b.



i) Which pair of numbers could you add to get a sum close to 4 000?

ii) Which pair of numbers differ by about 2 000?

iii) Which pair of numbers adds up to give a multiple of 10?

iv) Which number is almost double the other? Write them both down.

()

c. Use “multiplying by 100” and “halving” strategies to calculate:

$$8 \times 50 = \underline{\hspace{2cm}}$$

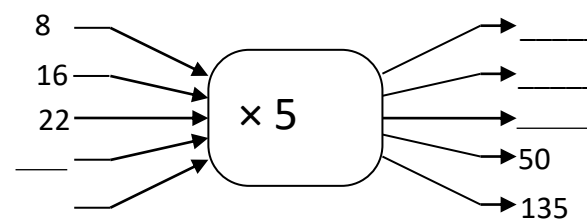
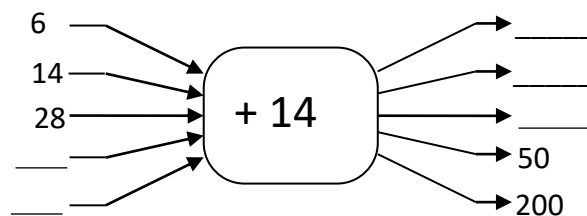
$$50 \times 11 = \underline{\hspace{2cm}}$$

$$50 \times 18 = \underline{\hspace{2cm}}$$

$$26 \times 50 = \underline{\hspace{2cm}}$$

()

d. Complete:



()

Memo: a. $3 \times 21 = 63$

$$22 \times 4 = 88$$

$$19 \times 5 = 95$$

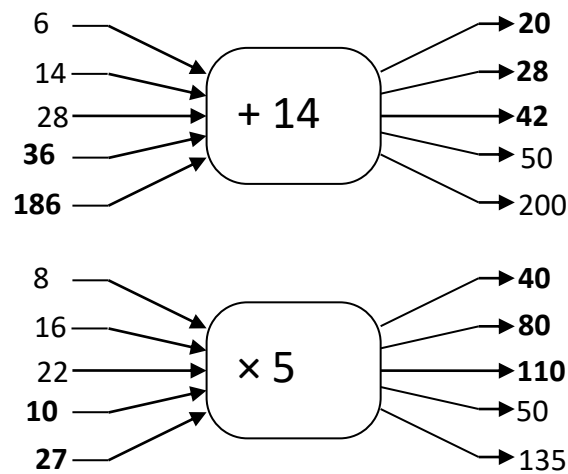
$$22 \times 6 = 132$$

$$19 \times 9 = 171$$

- b. i) 3 149 and 845
 ii) 6 300 and 4 503
 iii) 8 300 and 6 300
 iv) 845 and 1 682

c. $8 \times 50 = \mathbf{400}$
 $50 \times 11 = \mathbf{550}$
 $50 \times 18 = \mathbf{900}$
 $26 \times 50 = \mathbf{1\ 300}$

d.



1.1.3(4) a. Use a “rounding and compensating” strategy to calculate:

$247 + 39 = \underline{\hspace{2cm}}$

$263 + 59 = \underline{\hspace{2cm}}$

$344 + 48 = \underline{\hspace{2cm}}$

()

b. Use a “pairing” strategy to calculate:

$250 + 65 + 150 + 135 = \underline{\hspace{2cm}}$

$175 + 225 + 170 + 230 = \underline{\hspace{2cm}}$

$185 + 240 + 215 + 160 = \underline{\hspace{2cm}}$

()

c. Calculate:

$$\begin{array}{r} 71\,305 \\ + 5\,009 \\ \hline \end{array}$$

$$\begin{array}{r} 84\,082 \\ - 51\,888 \\ \hline \end{array}$$

()

Memo: a. 286 ; 322 and 392

b. 600 ; 800 and 800

c. 76 314 and 32 194

1.1.3(5) a. Calculate:

$$\begin{array}{r} 358\,305 \\ + 78\,019 \\ \hline \end{array}$$

$$\begin{array}{r} 464\,089 \\ - 51\,885 \\ \hline \end{array}$$

()

b. Calculate using the method that makes most sense to you. Show your working.

$$151 \times 82$$

$$3\,578 \div 25$$

$$416 \times 121$$

$$4\,092 \div 33$$

()

c. Multiply:

$$\begin{array}{r} 1\,305 \\ \times 19 \\ \hline \end{array}$$

()

d. Divide:

$$22 \overline{) 4\,867}$$

()

e. Calculate:

$$(1 + 2) \times 4 - 3$$

$$4 \times (6 + 2) - 7$$

$$5 + 3 \times (7 + 4)$$

$$(6 + 5) - 2 \times 3$$

()

Memo: a. 436 324 and 412 204

b. 12 382 ; 143 remainder 3 ; 50 336 and 124

c. 24 795

d. 221 remainder 5

e. 9 ; 25 ; 38 and 5

1.1.3(6) a. Calculate:

$$\begin{array}{r} 14\,358\,305 \\ + 437\,678\,019 \\ \hline \end{array}$$

$$\begin{array}{r} 571\,464\,089 \\ - 99\,951\,885 \\ \hline \end{array}$$

()

b. Multiply:

$$\begin{array}{r} 511\,305 \\ \times 109 \\ \hline \end{array}$$

()

c. Divide:

$$123 \overline{) 45\,678}$$

()

d. Calculate:

$$(14 + 23) \times 14 - 35$$

$$40 \times (26 + 52) - 77$$

$$55 + 3 \times (57 + 64)$$

$$(666 + 125) - 32 \times 20$$

()

- Memo**
- a. 452 036 324 and 471 512 204
 - b. 55 732 245
 - c. 371 remainder 45 or 371,365...
 - d. 483 ; 3 043 ; 418 ; 151

1.1.4 Multiples and factors

1.1.4(3) In this table:

41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70

List all the even numbers.

List all the multiples of 5.

List all the multiples of 7.

()

Memo 42 ; 44 ; 46 ; 48 ; 50 ; 52 ; 54 ; 56 ; 58 ; 60 ; 62 ; 64 ; 66 ; 68 ; 70
45 ; 50 ; 55 ; 60 ; 65 ; 70
42 ; 49 ; 56 ; 63 ; 70

()

1.1.4(4) a. Complete

Multiples of 15: 15 ; 30 ; 45 ; ____ ; ____ ; ____ ; ...

Multiples of 22: 22 ; 44 ; ____ ; 88 ; ____ ; ____ ; ...

Factors of 99: 1 ; ____ ; 9 ; ____ ; ____ ; 99

()

b. Write down all the factors of each number:

3 _____

4 _____

5 _____

13 _____

15 _____

32 _____

()

c.

5	6	7	9	12	15	16	17
20	25	32	39	44	68	72	88

Which of the numbers above have 10 as a factor? _____

Which of the numbers above are multiples of 11? _____

Which of the numbers above are divisible by 9? _____

Which of the numbers above have an odd number of factors? _____

_____ ()

Memo: a. Multiples of 15: 15 ; 30 ; 45 ; **60** ; **75** ; **90** ; ...
 Multiples of 22: 22 ; 44 ; **66** ; 88 ; _____ ; _____ ; ...
 Factors of 99: 1 ; **3** ; 9 ; **11** ; **33** ; 99 Note: Factors of 99 do not necessarily have to be written in this order.

- b. Factors of 3: 1 ; 3 ;
 Factors of 4: 1 ; 2 ; 4 ;
 Factors of 5: 1 ; 5 ;
 Factors of 13: 1 ; 13 ;
 Factors of 15: 1 ; 3 ; 5 ; 15 ;
 Factors of 32: 1 ; 2 ; 4 ; 8 ; 16 ; 32

Note: Factors do not necessarily have to be written in ascending order.

- c. 10 is a factor of: 20 ; Multiples of 11: 44 ; 88 ; Divisible by 9: 9 ; 72 ;
 Odd number of factors: 9 ; 16 ; 25

1.1.4(5) a. Complete.

Multiples of 45: 45 ; 90 ; 135 ; _____ ; _____ ; _____ ; ...

Multiples of 122: 122 ; 244 ; _____ ; 488 ; _____ ; _____ ; ...

Factors of 99: _____

Prime factors of 45: _____

()

b. Write down all the factors of each number:

13 _____

15 _____

32 _____

111 _____

568 _____

()

c.

5	81	189	215	363	450	425	988
---	----	-----	-----	-----	-----	-----	-----

Which of the numbers above is a factor of 162? _____

Which of the numbers above are multiples of 11? _____

Which of the numbers above are divisible by 9? _____

Which of the numbers above are prime numbers? _____

()

Memo: a. Multiples of 45: 45 ; 90 ; 135 ; **180 ; 225** ; 270 ; ...

Multiples of 122: 122 ; 244 ; **366** ; 488 ; **610 ; 732** ; ...

Factors of 99: **1 ; 3 ; 9 ; 11 ; 33 ; 99**

Prime factors of 45: **3** and **5**

b. Factors of 13: **1** and **13**

Factors of 15: **1 ; 3 ; 5 ;** and **15**

Factors of 32: **1 ; 2 ; 4 ; 8 ; 16** and **32**

Factors of 111: **1 ; 3 ; 37** and **111**

Factors of 568: **1 ; 2 ; 4 ; 8 ; 71 ; 142 ; 284 ; 568**

c. Factors of 162: **81**

Multiples of 11: **363**

Divisible by 9: **81 , 189 , 450**

1.1.4(6) a. Say whether or not the following statements are true or false. If a statement is false, rewrite it to make it true.

i) 30 is a multiple of 10.

ii) All prime numbers are odd.

iii) 33 is a multiple of 5.

iv) 6 is a factor of 33.

v) 5 is a multiple of 65.

()

b. The following numbers are written as products of their prime factors. Complete:

i) $15 = \underline{\quad} \times 5$

ii) $18 = 2 \times 3 \times \underline{\quad}$

iii) $24 = 2 \times 2 \times \underline{\quad} \times \underline{\quad}$

iv) $255 = 3 \times \underline{\quad} \times 17$

v) $210 = \underline{\quad} \times \underline{\quad} \times \underline{\quad} \times \underline{\quad}$

()

Memo: a. i) True

ii) False. All prime numbers, **except for 2**, are odd

iii) False. 33 is a multiple of 3 or 11. Or, [*any multiple of 5*] is a multiple of 5.

iv) False. 1; 3; 11 or 33 is a factor of 33. Or, 6 is a factor of [*any multiple of 6*]

v) False, 5 is a **factor** of 65

b. i) $15 = \mathbf{3} \times 5$

ii) $18 = 2 \times 3 \times \mathbf{3}$

iii) $24 = 2 \times 2 \times \mathbf{2} \times \mathbf{3}$

iv) $255 = 3 \times \mathbf{5} \times 17$

v) $210 = \mathbf{2} \times \mathbf{3} \times \mathbf{5} \times \mathbf{7}$

1.1.5 Properties of whole numbers

1.1.5(1) Complete.

$$14 + 3 = \underline{\quad}$$

$$3 + 14 = \underline{\quad}$$

$$15 + \underline{\quad} = 21$$

$$\underline{\quad} + 6 = 21$$

$$34 = 28 + \underline{\quad}$$

$$34 = \underline{\quad} + 6$$

$$75 + 81 = 81 + \underline{\quad}$$

()

Memo $14 + 3 = 17$

$$3 + 14 = 17$$

$$15 + 6 = 21$$

$$15 + 6 = 21$$

$$34 = 28 + 6$$

$$34 = 28 + 6$$

$$75 + 81 = 81 + 75$$

1.1.5(2) Make the sides equal.

$$124 + 245 = 245 + \underline{\quad}$$

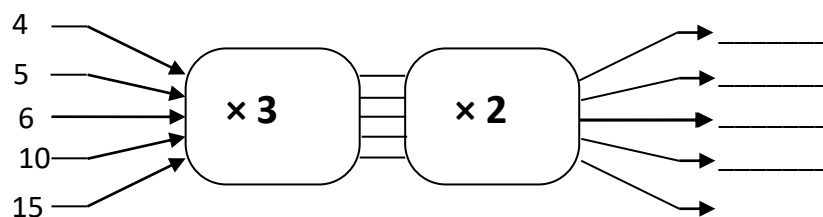
$$467 + 654 + 541 = 541 + \underline{\quad} + 654$$

()

Memo $124 + 245 = 245 + 124$

$$467 + 654 + 541 = 541 + 467 + 654$$

1.1.5(3) a. Complete.



()

b. Make the sides equal.

$$15 \times \underline{\quad} = 165$$

$$\underline{\quad} \times 11 = 165$$

$$124 \times 245 = 245 \times \underline{\quad}$$

$$467 \times 654 \times 541 = 541 \times \underline{\quad} \times 654 \quad ()$$

c. Make the sides equal.

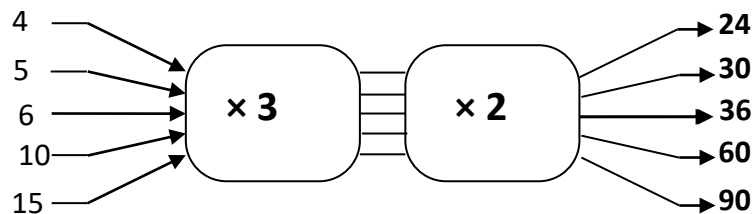
$$(15 + 7) + \underline{\quad} = 15 + (7 + 11)$$

$$94 + (670 + 57) + 68 = (94 + 670) + \underline{\quad} + 57$$

$$15 \times (76 + 59) = 15 \times \underline{\quad} + 15 \times 59$$

$$\underline{\quad} \times (34 - 9) = 5 \times 34 - 5 \times 9 \quad ()$$

Memo: a.



b. 11 ; 15 ; 124 ; 467

c. 11 ; 68 ; 76 ; 5

1.1.5(4) Make the sides equal.

$$(15 + 67) + \underline{\quad} = 15 + (67 + 114)$$

$$94 + (1\ 670 + 357) + 2\ 678 = (94 + 1\ 670) + \underline{\quad} + 357$$

$$15 \times (876 + 9\ 459) = 15 \times \underline{\quad} + 15 \times 9\ 459$$

$$\underline{\quad} \times (34\ 876 - 2\ 789) = 35 \times 34\ 876 - 35 \times 2\ 789$$

$$8\ 546 = 8\ 546 + \underline{\quad}$$

$$54\ 861 \times \underline{\quad} = 54\ 861 \quad ()$$

Memo

114 ; 2 678 ; 846 ; 35 ; 0 ; 1

1.1.5(5)	<p>Make the sides equal.</p> <p>$(1\ 025 + 67\ 895) + \underline{\hspace{2cm}} = 1\ 205 + (67\ 895 + 114\ 875)$</p> <p>$467\ 940 + (1\ 670 + 357\ 865) + 2\ 678\ 879 = (467\ 940 + 1\ 670) + \underline{\hspace{2cm}} + 357\ 865$</p> <p>$15\ 765 \times (876\ 897 + 9\ 459\ 750) = 15\ 765 \times \underline{\hspace{2cm}} + 15\ 765 \times 9\ 459\ 750$</p> <p>$\underline{\hspace{2cm}} \times (34\ 876\ 000 - 20\ 789) = 35\ 765 \times 34\ 876\ 000 - 35\ 765 \times 20\ 789$</p> <p>$768\ 546 = 768\ 546 + \underline{\hspace{2cm}}$</p> <p>$123\ 540\ 861 \times \underline{\hspace{2cm}} = 123\ 540\ 861$ ()</p>
Memo	114 875 ; 2 678 879 ; 876 897 ; 35 765 ; 0 ; 1
1.1.5(6)	<p>True or false?</p> <p>$9\ 456 + (1\ 545 + 6\ 787) = 9\ 456 + 1\ 545 + 9\ 456 + 6\ 787$</p> <p>$1\ 000\ 000 \times (348\ 908 - 2\ 789) = 1\ 000\ 000 \times 1\ 876 - 1\ 000\ 000 \times 2\ 789$</p> <p>$45\ 987 \times (4\ 876 + 119\ 459) = 119\ 459 \times 45\ 987 + 45\ 987 \times 4\ 876$</p> <p>$0 + 0 + 0 + 678\ 654\ 891 + 0 = 678\ 654\ 891 + 0 + 0 + 0$</p> <p>$7\ 550\ 980 \times 1 \times 1 \times 1 \times 1 \times 1 = 1 \times 755\ 098 \times 1$ ()</p>
Memo	False ; true ; true ; true ; false

1.1.6 Solving problems involving whole numbers

- 1.1.6(1)
- a. Sara gives her brother R18. She has R33 left over. How much money did Sara have to start with? ()
 - b. Belinda has 85 metres of ribbon. She cuts it into two pieces and gives one piece to her friend. She has 68 metres left. How much did she give her friend? ()
 - c. Yusuf's granny buys 13 sweets for his birthday party. Each sweet costs R3. How much did granny pay? ()
 - d. There are 48 children in a class. They work in groups of 6. How many groups are there? ()

Memo

- a. R51
- b. 17 metres
- c. R39
- d. 8 groups

- 1.1.6(2)
- a. There are 245 men, 167 women and 189 children at a cricket game. How many people are there at the cricket game? ()
 - b. There are 263 people at a soccer match. 96 are women. How many are men? ()
 - c. Mr Pretorius has 156 cupcakes. He sells the same number to Ben and Adam. He has 28 cupcakes left. How many cupcakes did Adam get? ()
 - d. There are 6 cans of cooldrink in a pack of cooldrinks. Yusuf carries 12 packs of cooldrinks. How many cooldrinks did he carry? ()
 - e. Share 68 marbles equally among 9 friends. ()

Memo

- a. 601 people
- b. 167 men
- c. 64 cupcakes
- d. 72 cooldrinks
- e. 7 marbles each with some (5) remaining.

1.1.6(3)	<p>a. Mrs Adams makes school uniforms. She buys 520 metres of blue material, 264 metres of grey material and 86 metres of yellow material. How many metres of material did she buy altogether? ()</p> <p>b. Peter wants to buy a television that costs R4 500. He has already saved R3 800. How much more money does he need? ()</p> <p>c. Mrs Manga bought 42 shirts for her workers. Each shirt cost R86. How much did she pay altogether? ()</p> <p>d. Mrs Jansen uses 2 cups of self-raising flour to bake 24 cupcakes. How much self-raising flour would she use if she wanted to bake 6 cupcakes? ()</p> <p>e. When Gary gives his small dog 1 biscuit, he gives his big dog 2 biscuits.</p> <ul style="list-style-type: none"> • If his small dog gets 3 biscuits, how many will his big dog get? () • If his big dog gets 12 biscuits, how many biscuits will his small dog get? () • Gary gives the dogs 21 biscuits. How many biscuits will his small dog get and how many biscuits will his big dog get? ()
Memo	<p>a. 870 metres</p> <p>b. R700</p> <p>c. R3 612</p> <p>d. $\frac{1}{2}$ cup</p> <p>e. 6 biscuits ; 6 biscuits ; 7 biscuits for the small dog and 14 for the big dog.</p>
1.1.6(4)	<p>a. A rugby field is 100 metres long and 50 metres wide. How far will it be if you ran six times around the rugby field? ()</p> <p>b. A sheep farmer shears 250 sheep per day. How many sheep will he shear in two full week? ()</p> <p>c. Lindi orders 160 flowers for table decorations. She wants to put 11 flowers in each vase. How many vases can she fill? ()</p> <p>d. Refilwe paid R45 for 5 litres of orange squash. Bheki paid R40 for 4 litres of orange squash. Who paid more per litre? ()</p>

	<p>e. A bus travels at 75 km/h. How far does the bus travel in:</p> <ul style="list-style-type: none"> • 1 hour? • 3 hours? <p style="text-align: right;">()</p>
Memo	<p>a. 1 800 metres b. 3 500 sheep c. 14 vases with 6 flowers left over. d. Bheki paid R10 per litre and Refilwe paid R9 per litre, so Bheki paid more. e. 75 km ; 225 km.</p>
1.1.6(5)	<p>a. In July the Bafana Bafana team played three matches in the African Cup of Nations competition. At the first match there were 61 058 spectators, 53 238 watched the second match and 55 593 spectators watched the third game.</p> <ul style="list-style-type: none"> • Estimate how many spectators watched the three games altogether. • Calculate the number of spectators there were in total. • Each spectator paid R120. How much was paid altogether? <p style="text-align: right;">()</p> <p>b. Mr. Vilakazi inherited R203 608,98. He bought himself a car for R80 500,79 and went on holiday for R22 546. How much of his inheritance does he have left?</p> <p style="text-align: right;">()</p> <p>c. An aeroplane flies at an average speed of 475 kilometres per hour. How far does it fly in 19 hours?</p> <p style="text-align: right;">()</p> <p>d. A box contains 144 apples and a school buys 12 boxes of apples. There are 535 learners at the school. The apples are shared equally amongst the learners. How many apples will each learner get?</p> <p style="text-align: right;">()</p> <p>e. Greta sells pencils in boxes for R24 for 12 pencils or in bags for R7 for 3 pencils. Calculate the price per pencil for a box and a bag of pencils and say which is cheaper to buy.</p> <p style="text-align: right;">()</p>
Memo	<p>a. Approx 170 000 ; 169 889 spectators ; R20 386 680 b. R100 562,19 c. 9 025 km/h d. 3 apples each with 123 left over. e. Box: R2 per pencil ; Bag: R2,33 per pencil. It is cheaper to buy a box.</p>

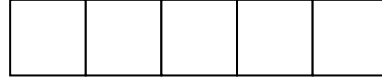
1.1.6(6)	<p>a. On a packet of cat food, it is recommended that a 4 kg cat should be fed $\frac{1}{2}$ a cup of cat food a day. If you have a cat that weighs 6 kg, how much of this food should you give it per day? ()</p> <p>b. A cricketer scored a average rate of 66 runs per hour. If he batted for 90 minutes, did he score more than 100 runs? ()</p> <p>c. Busi and Makhosi buy a large bag of onions for R69. The bag contains 132 onions. If Busi contributes R46 and Makhosi contributes R23, how many onions should each one get? ()</p>
Memo	<p>a. $\frac{3}{4}$ cup</p> <p>b. No, he scored 99 runs.</p> <p>c. Busi should get 88 onions and Makhosi should get 44 onions</p>

1.2 Common fractions

1.2.1 Describing and ordering fractions

1.2.1(1) a. Each rectangle is cut into equal pieces.

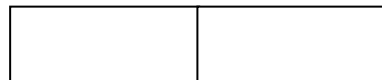
- Each piece is called _____



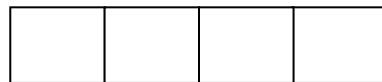
- Each pieces is called _____



- Each piece is called _____

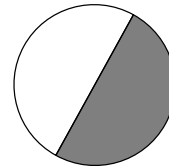
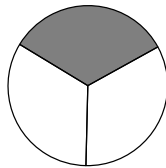
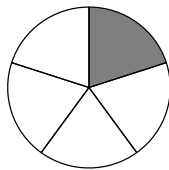


- Each piece is called _____



()

b. How much in each circle?



()

Memo a. a fifth ; a third ; a half ; a quarter (also accept a fourth)

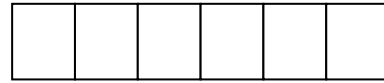
b. 1 fifth ; 1 third ; 1 half

1.2.1(2) a. Each rectangle is cut into equal pieces.

- Each piece is called _____



- Each piece is called _____



- Each piece is called _____

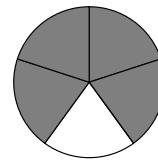
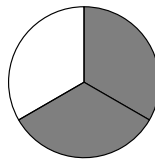
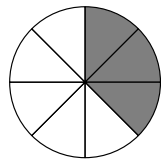


- Each piece is called _____



()

b. How much in each circle?

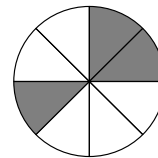
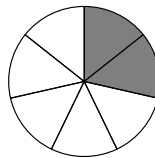
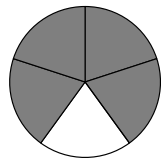


()

Memo: a. a fifth ; a sixth ; an eighth ; a quarter

b. 3 eighths ; 2 thirds ; 4 fifths

1.2.1(3) a. How much in each circle?



()

b. Which is bigger?

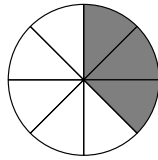


3 fifths

OR

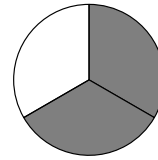


3 sixths

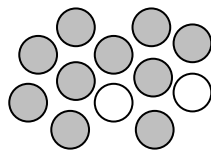


3 eighths

OR

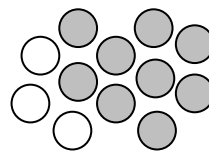


2 thirds



5 sixths

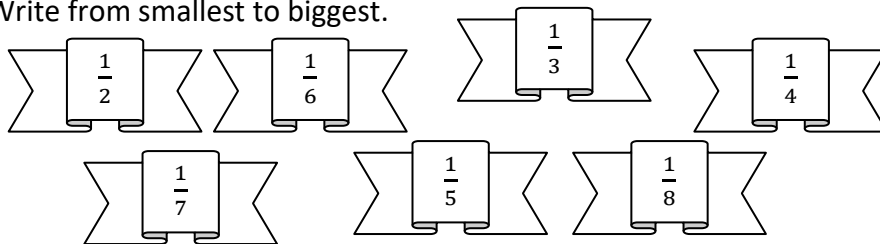
OR



3 quarters

()

c. Write from smallest to biggest.



()

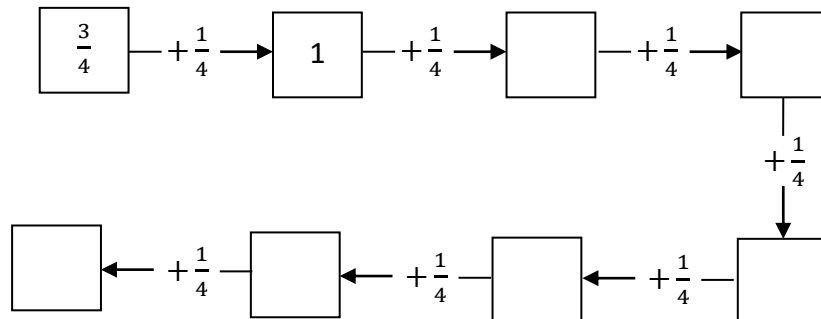
Memo: a) 4 fifths or $\frac{4}{5}$; 2 sevenths or $\frac{2}{7}$; 3 eighths or $\frac{3}{8}$

b) 3 fifths ; 2 thirds ; 5 sixths.

c) $\frac{1}{8}$, $\frac{1}{7}$, $\frac{1}{6}$, $\frac{1}{5}$, $\frac{1}{4}$, $\frac{1}{3}$, $\frac{1}{2}$

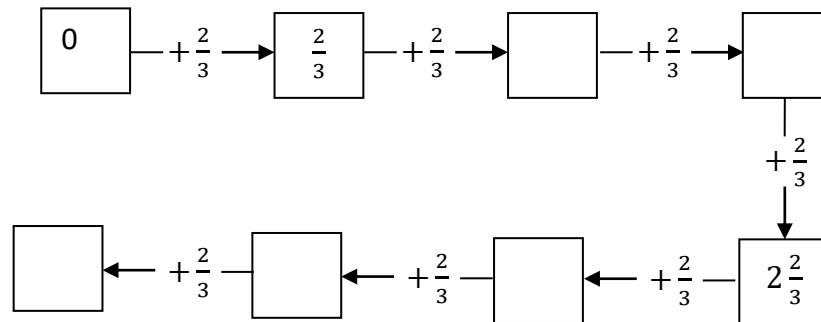
1.2.1(4)

a. Complete:



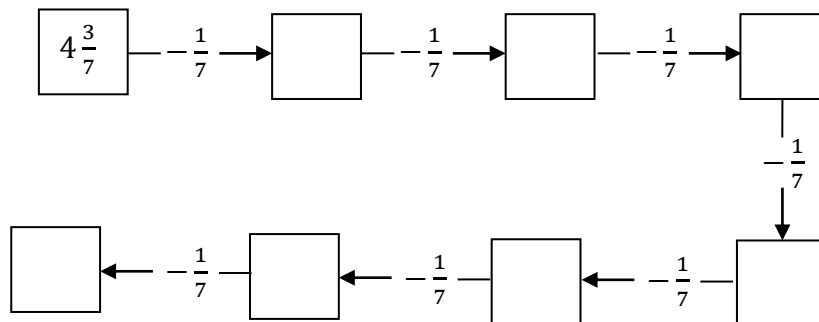
()

b. Complete



()

c. Complete.



()

d. Fill in the correct sign: < , > or =.

$$\frac{5}{9} \square \frac{5}{8}$$

$$\frac{1}{2} \square \frac{3}{8}$$

$$\frac{1}{5} \square \frac{2}{10}$$

$$\frac{2}{3} \square \frac{4}{9}$$

()

e. Write from smallest to biggest.

$$\frac{3}{4}$$

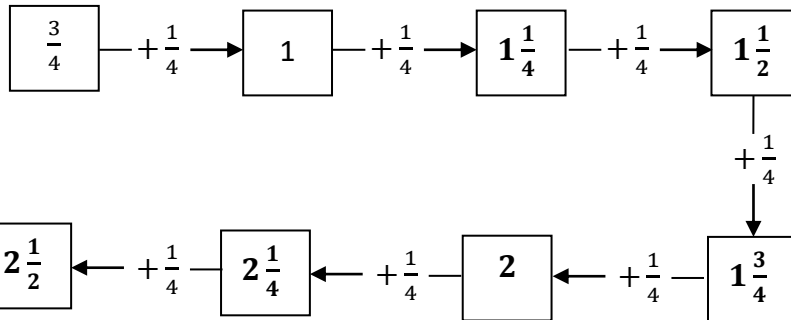
$$\frac{2}{3}$$

$$\frac{1}{6}$$

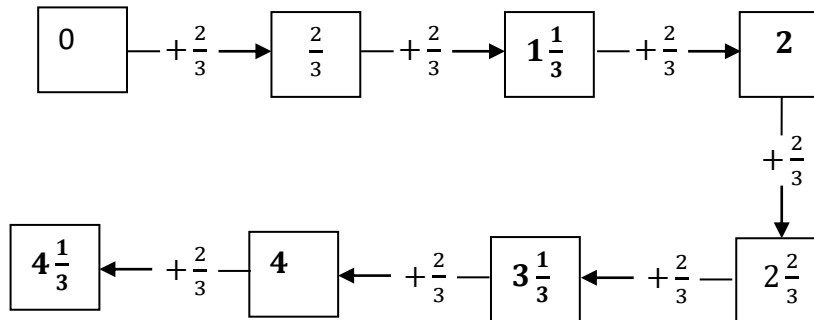
$$\frac{7}{12}$$

()

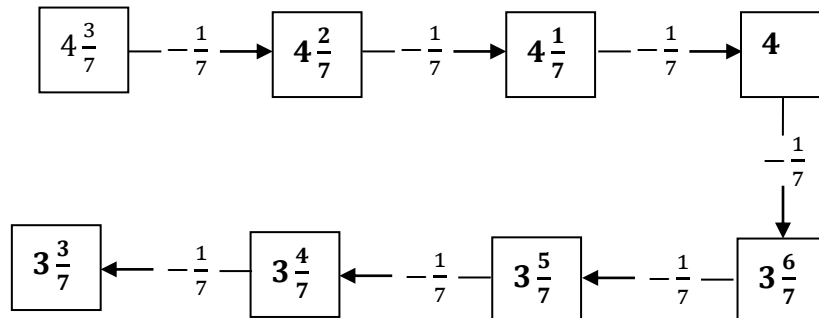
Memo: a.



b.



c.



d. $\frac{5}{9} < \frac{5}{8}$; $\frac{1}{2} > \frac{3}{8}$; $\frac{1}{5} = \frac{2}{10}$; $\frac{2}{3} > \frac{4}{9}$

e. $\frac{1}{6}, \frac{7}{12}, \frac{2}{3}, \frac{3}{4}$

1.2.1(5) a. Fill in the correct sign: $<$, $>$ or $=$.

$$\frac{3}{100} \square \frac{3}{10}$$

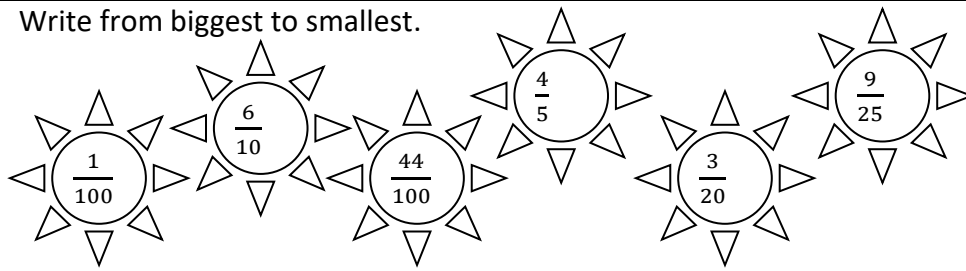
$$\frac{1}{2} \square \frac{50}{100}$$

$$\frac{11}{12} \square \frac{1}{4}$$

$$\frac{8}{10} \square \frac{66}{100}$$

()

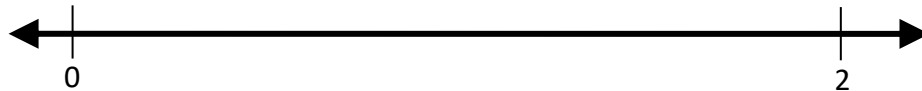
b. Write from biggest to smallest.



()

c. Place these numbers on the number line as carefully as you can.

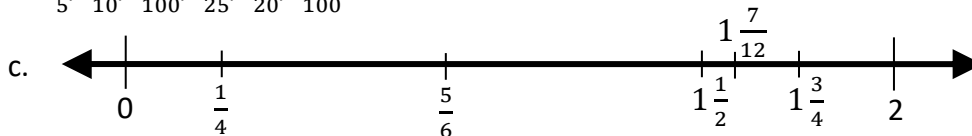
$1\frac{3}{4}$	$\frac{5}{6}$	$1\frac{1}{2}$	$1\frac{7}{12}$	$\frac{1}{4}$
----------------	---------------	----------------	-----------------	---------------



()

Memo: a. $\frac{3}{100} < \frac{3}{10}$; $\frac{1}{2} = \frac{50}{100}$; $\frac{11}{12} > \frac{1}{4}$; $\frac{8}{10} > \frac{66}{100}$

b. $\frac{4}{5}$, $\frac{6}{10}$, $\frac{44}{100}$, $\frac{9}{25}$, $\frac{3}{20}$, $\frac{1}{100}$



1.2.1(6)

a. Fill in the correct sign: < , > or =.

$$\frac{3}{100} \square \frac{3}{1000}$$

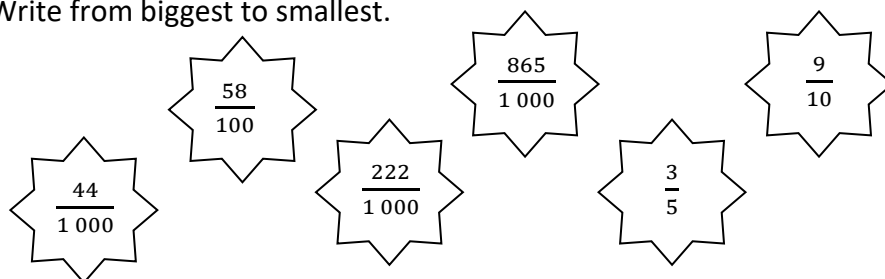
$$\frac{1}{2} \square \frac{50}{1000}$$

$$-\frac{11}{12} \square -\frac{1}{4}$$

$$\frac{8}{1000} \square \frac{66}{100}$$

()

b. Write from biggest to smallest.



()

Memo: a. $\frac{3}{100} > \frac{3}{1\,000}$; $\frac{1}{2} > \frac{50}{1\,000}$; $-\frac{11}{12} < -\frac{1}{4}$; $\frac{8}{1\,000} < \frac{66}{100}$

Negative numbers are not in the Intermediate Phase curriculum. This question has been posed as a problem solving question to create an awareness that numbers less than 0 do exist.

b. $\frac{9}{10}$, $\frac{865}{1\,000}$, $\frac{3}{5}$, $\frac{222}{1\,000}$, $\frac{44}{1\,000}$

1.2.2 Calculations with fractions

1.2.2(3) Calculate:

$$\frac{1}{6} + \frac{4}{6} =$$

$$\frac{1}{3} + \frac{2}{3} =$$

$$\frac{5}{8} + \frac{2}{8} =$$

Which answer is the biggest? ()

Memo: $\frac{5}{6}$; 1 ; $\frac{7}{8}$

1 is biggest.

1.2.2(4) a. Calculate:

$$\frac{5}{6} - \frac{4}{6} =$$

$$\frac{4}{7} + \frac{3}{7} =$$

$$1\frac{7}{12} + 3\frac{4}{12} =$$

$$\frac{49}{50} - \frac{18}{50} = \quad ()$$

b. Calculate:

$$\frac{1}{8} + \frac{2}{8} + \frac{3}{8} + \frac{4}{8} + \frac{5}{8} =$$

$$\frac{5}{12} + \frac{3}{12} - \frac{7}{12} =$$

$$\frac{17}{25} - \frac{1}{25} + \frac{9}{25} =$$

$$5\frac{3}{5} - 1\frac{1}{5} + 2 = \quad ()$$

c. There are 24 Smarties in a box. Complete:

$$\frac{1}{6} \text{ of a box} = \underline{\hspace{2cm}} \text{ Smarties}$$

$$\frac{1}{3} \text{ of a box} = \underline{\hspace{2cm}} \text{ Smarties}$$

$$\frac{1}{3} \text{ of a box} + \frac{1}{6} \text{ of a box} = \underline{\hspace{2cm}} \text{ Smarties}$$

$$\frac{1}{2} \text{ box} + \frac{1}{4} \text{ box} = \underline{\hspace{2cm}} \text{ Smarties}$$

$$\frac{3}{4} \text{ of a box} = \underline{\hspace{2cm}} \text{ Smarties} \quad (\underline{\hspace{1cm}})$$

Memo a. $\frac{1}{6}$; 1 ; $4\frac{11}{12}$; $\frac{31}{50}$

b. $\frac{15}{8}$ or $1\frac{7}{8}$; $\frac{1}{12}$; 1 ; $6\frac{2}{5}$

c. 4 ; 8 ; 12 ; 18 ; 18

1.2.2(5) a. Calculate:

$$\frac{1}{8} + \frac{2}{16} + \frac{3}{32} + \frac{4}{64} =$$

$$\frac{5}{12} + \frac{3}{4} - \frac{1}{6} =$$

$$3\frac{1}{5} - 2\frac{1}{25} + 1\frac{9}{10} = \quad (\underline{\hspace{1cm}})$$

b. Calculate:

$$\frac{1}{2} \text{ of } 6 = \underline{\hspace{2cm}}$$

$$\frac{1}{3} \text{ of } 6 = \underline{\hspace{2cm}}$$

$$\frac{2}{3} \text{ of } 6 = \underline{\hspace{2cm}}$$

$$\frac{3}{4} \text{ of } 12 = \underline{\hspace{2cm}} \quad (\underline{\hspace{1cm}})$$

Memo a. $\frac{13}{32}$; 1 ; $3\frac{3}{50}$

b. 3 ; 2 ; 4 ; 9

1.2.2(6)

a. Calculate.

i) $\frac{3}{4} - \frac{6}{8} + \frac{3}{20}$

ii) $3\frac{3}{5} - 1\frac{1}{3}$

iii) $2\frac{3}{4} + 3\frac{1}{6}$

()

b. Calculate.

i) $\frac{1}{4}$ of R360

ii) $\frac{1}{2} \times \frac{1}{3}$

iii) $\frac{3}{5} \times 55$

iv) $\frac{5}{8} \times 10 \times \frac{3}{5}$

()

Memo:

a. i) $\frac{3}{20}$

ii) $2\frac{4}{15}$

iii) $5\frac{11}{12}$

b. i) R90

ii) $\frac{1}{6}$

iii) 33

iv) $3\frac{3}{4}$

1.2.3 Solving problems		
1.2.3(1)	a. Three children share 10 chocolate bars equally. How much will each child get? Show how they share it.	()
	b. Five friends share 6 sausages equally. How much sausage will each child get? Show how they share it.	()
Memo	a. 3 each with a chocolate left over (<i>also accept 3 and a third</i>) b. 1 each with a sausage left over (<i>also accept 1 and a fifth</i>)	
1.2.3(2)	6 children share 9 chocolate bars equally. How much chocolate will each child get?	()
Memo	1 and a half (<i>also accept $1\frac{1}{2}$</i>)	
1.2.3(3)	a. There are nine beetles on a tree. $\frac{1}{3}$ of the beetles are green. The rest are brown. i) How many beetles are green? ii) How many beetles are brown? iii) What fraction of the beetles are brown?	()
	b. Mrs Faku needs $\frac{1}{3}$ of a cup of nuts to make one tray of muffins. She has 5 cups of nuts. How many trays of muffins can she make?	()
Memo	a. i) 3 green beetles iii) $\frac{2}{3}$ b. 15 trays	ii) 6 brown beetles
1.2.3(4)	a. Martha uses $\frac{2}{3}$ of a loaf of bread every day to make sandwiches for her children. i) How many loaves of bread will she use in 5 days? ii) Martha has 2 loaves of bread. For how many days can she make sandwiches?	()

	<p>b. Mrs. Jackson makes dresses. She buys 8 pieces of blue material. Each piece of material is $1\frac{1}{2}$ metres long. How many metres does she buy altogether? ()</p> <p>c. Mrs. Shonga needs $\frac{1}{4}$ metre of material to make one pillow case. How many metres does she need to make 8 pillow cases? ()</p>
Memo:	<p>a. i) $3\frac{1}{3}$ ii) 3 days</p> <p>b. 12 metres c. 2 metres</p>
1.2.3(5)	<p>a. There are three cakes that are shared equally among eight friends. What fraction of a cake does each friend get? ()</p> <p>b. One third of a box contains 6 apples.</p> <p>i) How many apples are there in a full box?</p> <p>ii) How many apples are there in $1\frac{1}{2}$ boxes ()</p> <p>c. A dam is $\frac{2}{3}$ full. During the rain storm it fills by another $\frac{1}{5}$.</p> <p>i) How full is the dam after the storm?</p> <p>ii) Will the dam overflow if it fills by a further $\frac{1}{3}$. Explain your answer. ()</p>
Memo	<p>a. $\frac{3}{8}$</p> <p>b. i) 18 apples ii) 27 apples</p> <p>c. i) $\frac{13}{15}$</p> <p>ii) Yes. Adding $\frac{1}{3}$ to $\frac{2}{3}$ gives a whole which means that the dam is full and there is no space for the extra $\frac{1}{5}$ or adding another $\frac{1}{3}$ to $\frac{13}{15}$ means the dam is $1\frac{1}{5}$ full.</p>
1.2.3(6)	<p>a. In a class, $\frac{2}{3}$ of the learners do school sports. Out of these learners, $\frac{3}{5}$ play soccer. What fraction of the whole class plays soccer? ()</p> <p>b. Matthew is a student. He gets an allowance of R600. He spends $\frac{2}{5}$ of his allowance on football and $\frac{3}{20}$ on books. How much money does he have left? ()</p>

- c. Thembi gives $\frac{1}{4}$ of her pocket money to Jackie. Thembi banks $\frac{2}{5}$ of what remains and spends the rest.

i) What fraction of the whole amount does Thembi spend?

ii) If Thembi's pocket money is R20 a day, how much does she bank in 5 days? ()

- d. John earns R480 per month by working as a waiter on weekends.

He is able to save $\frac{1}{3}$ of his earnings.

He spends $\frac{1}{8}$ of his earnings on books and CDs, $\frac{1}{4}$ of his earnings on clothes and $\frac{1}{6}$ of his earnings on movies.

i) Calculate how much money he saves.

ii) Calculate how much money he spends on books and CDs, on clothes and on movies.

iii) What fraction of John's money is left over for other things?

iv) John bought a raffle ticket for R12. What fraction of his earnings did he spend on the ticket? ()

Memo: a. $\frac{2}{5}$

b. R270

c. i) $\frac{7}{20}$

ii) R30

d. i) R160

ii) R60 ; R120 ; R80

iii) $\frac{11}{24}$

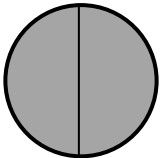
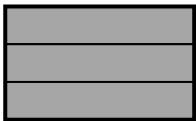
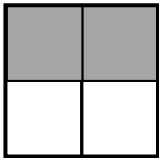
iv) $\frac{1}{40}$

1.2.4 Percentages

1.2.4(5)	a. Calculate.		
	i) 10% of 460		
	ii) 25% of 460		
	iii) 35% of 450		
	iv) 80% of 450		()
	b. Selwyn pays 35% of his annual salary in income tax. How much income tax will he pay if he earns R360 000 per year.		()
Memo	a. i) 46	ii) 115	
	iii) 161	iv) 368	
	b. R126 000		
1.2.4(6)	a. Gareth buys a plot of land with an area of 750 square metres. He builds a house with an area of 600 square metres.		
	i) What percentage of the plot will be covered by the house?		
	ii) Municipal regulations state that no more than 90% of a plot may be built on. How many square metres of his plot may Gareth cover with buildings?		()
	b. Dan makes and sells boerewors rolls. It costs him R12 to make a boerewors roll. He sells the boerewors rolls at R20 each.		
	i) What is his percentage profit per boerewors roll?		
	ii) One day, he makes 80 boerewors rolls. He sells 20 of these for R20. But then he lowers his price and sells the rest for R10,50. Approximately, what percentage profit/loss does he make for the day?		()
Memo:	a. i) $\frac{4}{5}$	ii) 675 square metres	
	b. i) 60%	ii) 16%	

1.2.5 Equivalent forms

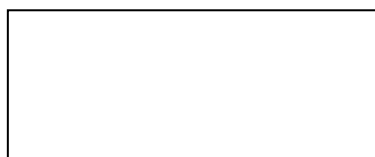
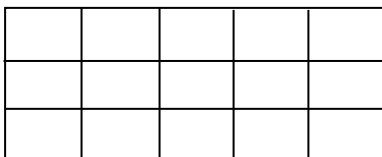
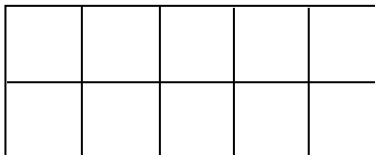
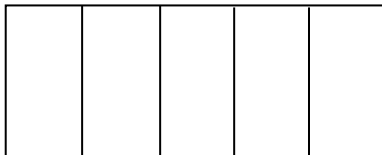
1.2.5(2) Complete.

	2 halves	___ whole
	___ thirds	1 whole
	1 half	___ quarters

()

Memo 2 halves = 1 whole ; 3 thirds = 1 whole ; 1 half = 2 quarters

1.2.5(3) a. Shade in $\frac{1}{5}$ of each rectangle:



Complete:

$$\frac{1}{5} = \text{---} = \text{---} = \text{---} = \text{---}$$

()

b. Complete.

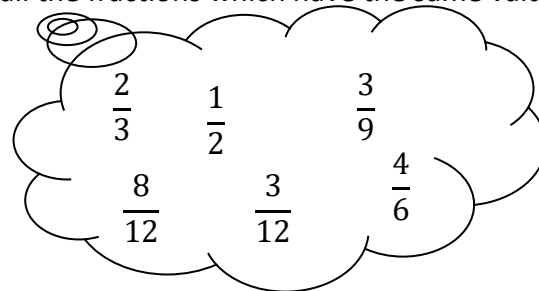
i) $\frac{1}{2} = \frac{\quad}{4} = \frac{\quad}{6} = \frac{\quad}{8} = \frac{\quad}{10} = \frac{\quad}{12}$

ii) $\frac{1}{4} = \frac{2}{\quad} = \frac{3}{\quad} = \frac{4}{\quad} = \frac{5}{\quad} = \frac{6}{\quad}$

iii) $\frac{1}{6} = \frac{\quad}{12} = \frac{3}{\quad} = \frac{\quad}{24} = \frac{5}{\quad} = \frac{\quad}{36}$

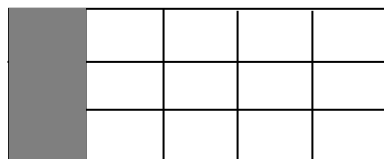
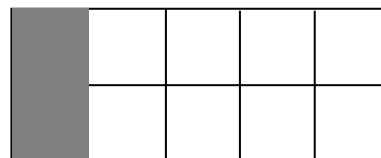
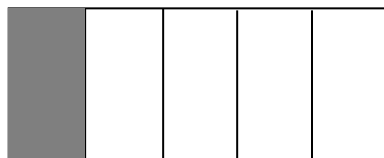
()

c. Circle all the fractions which have the same value.



()

Memo: a. *There are other possible answers for this question.*



$\frac{1}{5} = \frac{2}{10} = \frac{3}{15} = \frac{4}{20} = \frac{5}{25}$

b. i) $\frac{1}{2} = \frac{2}{4} = \frac{3}{6} = \frac{4}{8} = \frac{5}{10} = \frac{6}{12}$

ii) $\frac{1}{4} = \frac{2}{8} = \frac{3}{12} = \frac{4}{16} = \frac{5}{20} = \frac{6}{24}$

iii) $\frac{1}{6} = \frac{2}{12} = \frac{3}{18} = \frac{4}{24} = \frac{5}{30} = \frac{6}{36}$

c. $\frac{2}{3}; \frac{4}{6}; \frac{8}{12}$

1.2.5(4) a. Complete.

i) $\frac{1}{6} = \frac{\quad}{18}$

ii) $\frac{5}{6} = \frac{20}{\quad}$

iii) $\frac{3}{\quad} = \frac{9}{24}$

()

b. Write the next three fractions in each pattern

i) $\frac{2}{7}; \frac{4}{14}; \frac{6}{21}; \quad; \quad; \quad$

ii) $\frac{7}{10}; \frac{14}{20}; \frac{21}{30}; \quad; \quad; \quad$

iii) $\frac{3}{20}; \frac{6}{40}; \frac{9}{60}; \quad; \quad; \quad$

()

Memo: a i) $\frac{1}{6} = \frac{3}{18}$

ii) $\frac{5}{6} = \frac{20}{24}$

iii) $\frac{3}{8} = \frac{9}{24}$

b i) $\frac{2}{7}; \frac{4}{14}; \frac{6}{21}; \frac{8}{28}; \frac{10}{35}; \frac{12}{42}$

ii) $\frac{7}{10}; \frac{14}{20}; \frac{21}{30}; \frac{28}{40}; \frac{35}{50}; \frac{42}{60}$

iii) $\frac{3}{20}; \frac{6}{40}; \frac{9}{60}; \frac{12}{80}; \frac{15}{100}; \frac{18}{120}$

1.2.5(5) Complete.

Percentage	Decimal fraction	Common fraction
10%		
1%		
50%		
25%		
75%		

()

Memo:

Percentage	Decimal fraction	Common fraction
10%	0,1	$\frac{1}{10}$
1%	0,01	$\frac{1}{100}$
50%	0,5	$\frac{1}{2}$
25%	0,25	$\frac{1}{4}$
75%	0,75	$\frac{3}{4}$

1.2.5(6) a. Write as percentages:

i) $\frac{56}{100}$

ii) $\frac{5}{100}$

iii) $\frac{5}{10}$

iv) $\frac{3}{4}$

v) $\frac{35}{50}$

()

b. Complete.

Percentage	Decimal fraction	Common fraction
10%		
	0,01	
		$\frac{1}{5}$
2%		
	0,3	

()

- Memo:** a. i) 56% ii) 5%
- iii) 50% iv) 75%
- v) 70%

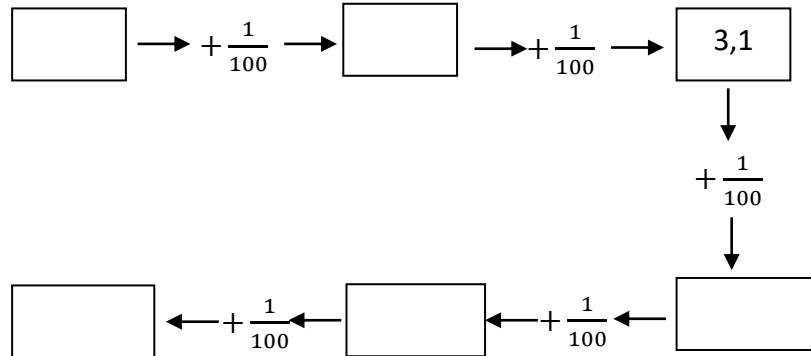
b.

Percentage	Decimal fraction	Common fraction
10%	0,1	$\frac{1}{10}$
1%	0,01	$\frac{1}{100}$
20%	0,2	$\frac{1}{5}$
2%	0,02	$\frac{1}{50}$
30%	0,3	$\frac{3}{10}$

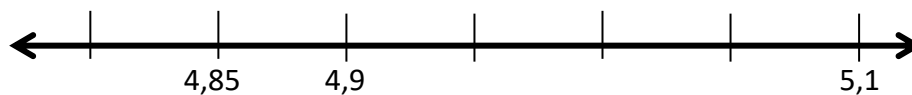
1.3 Decimal fractions

1.3.1 Recognising, ordering and place value of decimal fractions

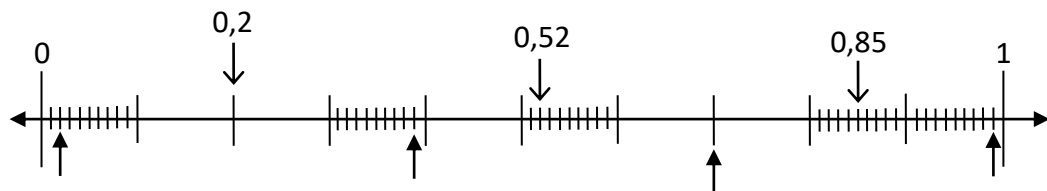
1.3.1(5) a. Complete the chain.



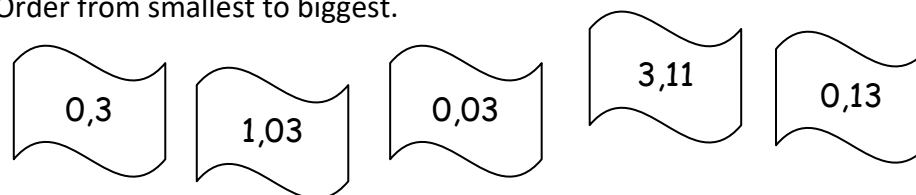
b. Complete.



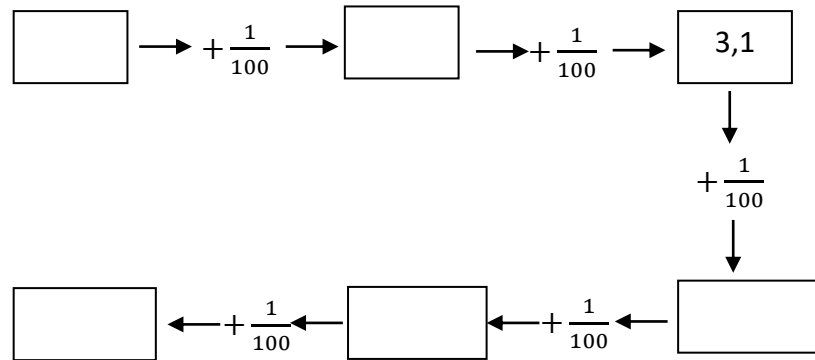
c. Fill in the numbers on the number line where indicated. Write your answers below the arrows



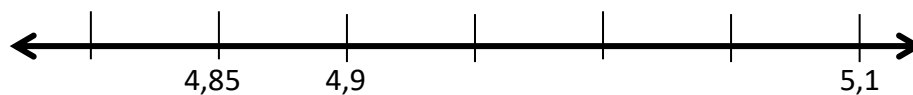
d. Order from smallest to biggest.



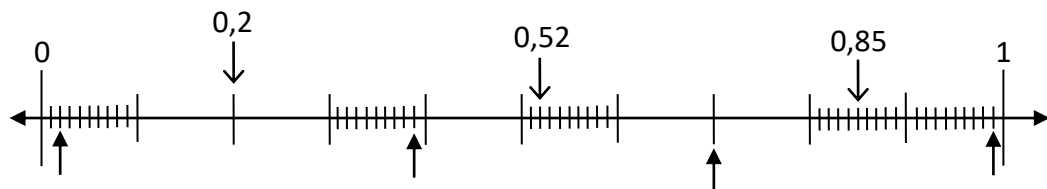
Memo: a.



b.

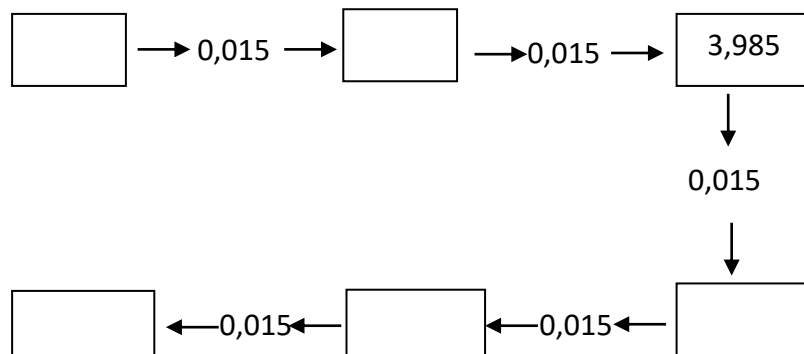


c.



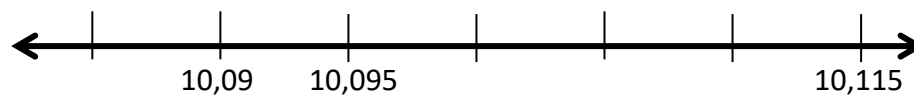
d. 0,03 ; 0,13 ; 0,3 ; 1,03 ; 3,11

1.3.1(6) a. Complete the chain.



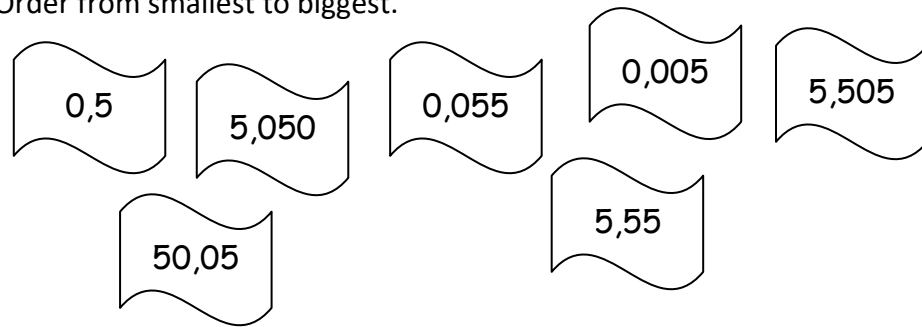
()

b. Complete.



()

c. Order from smallest to biggest.



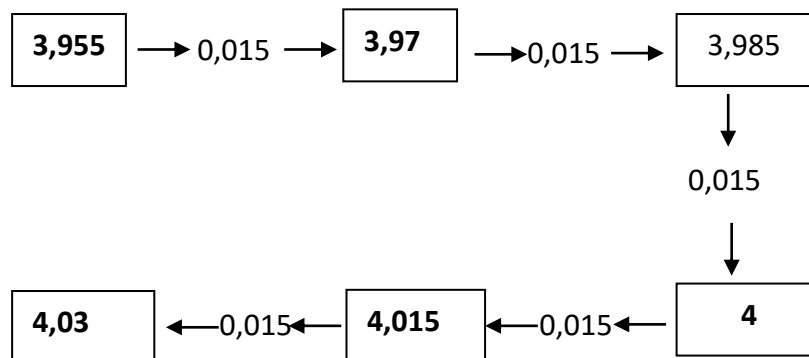
()

d. Round off to two decimal places.

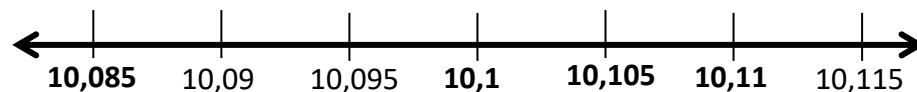
- i) 4,007
- ii) 12,984
- iii) 175,000598
- iv) 123,09701

()

Memo: a.



b.



c. 0,005 ; 0,055 ; 0,5 ; 5,050 ; 5,505 ; 5,55 ; 50,05

- d. i) 4,01
- ii) 12,98
- iii) 175,00
- iv) 123,10

1.3.2 Calculations with decimal fractions

1.3.2(5) a. Calculate.

i) $6,4 + 3,2$

ii) $7,5 + 8,9$

iii) $19,6 - 5,3$

iv) $4,4 - 1,7$

v) $R3,99 + R8,99$

vi) $R10 - R7,89$ ()

b. Calculate.

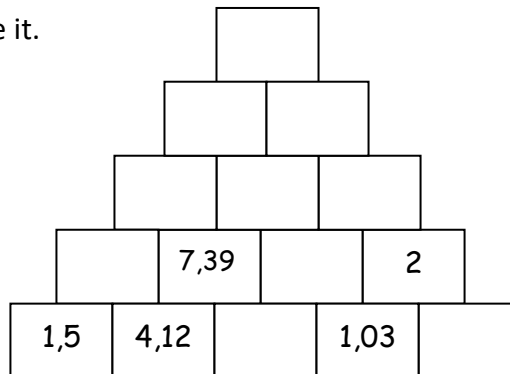
i) $0,1 + 0,1 + 0,1 + 0,1 + 0,1 + 0,1 + 0,1 + 0,1$

ii) $10 \times 5,2$

iii) $5,09 \times 10$

iv) $8,7 \times 100$ ()

c. Complete by adding the two numbers next to each other to get the number above it.



()

Memo a. i) 9,6

ii) 16,4

iii) 14,3

iv) 2,7

v) R12,98

vi) R2,11

- C.

()

()

Memo:	a.	i)	4,807	ii)	6,591
		iii)	R15,96	iv)	R12,02
		v)	577,92	vi)	82,8546
	b.	i)	0,002	ii)	0,08

1.3.3 Solving problems

- 1.3.3(5) a. A builder buys pipes that are 5,6 metres long. If he buys 10 pipes, what is the total length of the pipes? ()
- b. Thembi went clothes shopping. She bought a dress for R250, 90, shoes for R150,35 and a jersey for R178,55.
- i) How much did she spend?
- ii) How much change did she get from R1 000?

- Memo** a. 56 metres
- b. i) R579,80
- ii) R420,20

- 1.3.3(6) a. Mrs Jackson sells dresses. She uses 1,75 metres of material for each dress. The material costs R67,95 per metre. How much will she pay to make 7 dresses? ()
- b. Mrs. Masipa's car drives 621,452 kilometres on 52 litres of petrol.
- i) How far can she drive on 1 litres of petrol?
- ii) Estimate how many litres of petrol the car will need to drive 100 kilometres.

- Memo:** a. R832,39
- b. i) 11,591 km
- ii) Approximately 8 litres

1.3.4 Equivalent forms

1.3.4(5)

Percentage	Decimal fraction	Common fraction
	0,5	
	0,01	
	0,05	
	0,8	
	0,3	

()

Memo

Percentage	Decimal fraction	Common fraction
50%	0,5	$\frac{1}{2}$
1%	0,01	$\frac{1}{100}$
5%	0,05	$\frac{1}{20}$
80%	0,8	$\frac{4}{5}$
30%	0,3	$\frac{3}{10}$

1.3.4(6)

Percentage	Decimal fraction	Common fraction
20%		
	0,4	
		$\frac{1}{8}$
12%		
	0,3	

()

Memo:

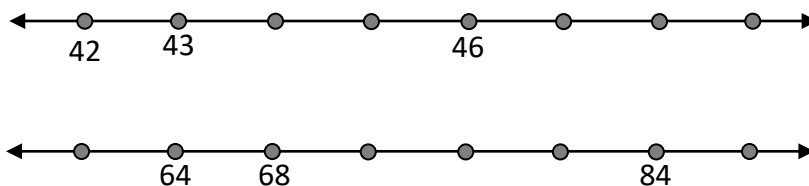
Percentage	Decimal fraction	Common fraction
20%	0,2	$\frac{1}{5}$
40%	0,4	$\frac{2}{5}$
12,5%	0,125	$\frac{1}{8}$
12%	0,12	$\frac{3}{25}$
30%	0,3	$\frac{3}{10}$

2. PATTERNS, FUNCTIONS AND ALGEBRA

2.1 Numeric Patterns

2.1.1 Investigate and extend patterns

2.1.1(1) a. Complete.



()

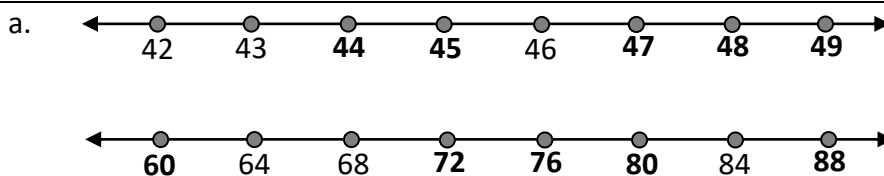
b. Describe the pattern.

3 ; 6 ; 9 ; 12 ; 15 ; 18 ; 21 ; 24 ; ...

100 ; 90 ; 80 ; 70 ; 60 ; 50 ; 40 ; ...

()

Memo



b. Increasing by 3 / Adding 3 each time.

Decreasing by 10 / Subtracting (taking away) 10 each time

2.1.1(2) a. Complete.

50 ; 100 ; 150 ; ____ ; ____ ; ____ ; ____ ; ____ ; ____ ; ____ ; ____

25 ; 50 ; 75 ; ____ ; ____ ; ____ ; ____ ; ____ ; ____ ; ____ ; ____ ; ____

()

b. Describe the pattern.

5 ; 10 ; 15 ; 20 ; 25 ; ...

2 ; 4 ; 8 ; 16 ; ...

()

c. Create your own pattern of five numbers.

Describe your pattern.

()

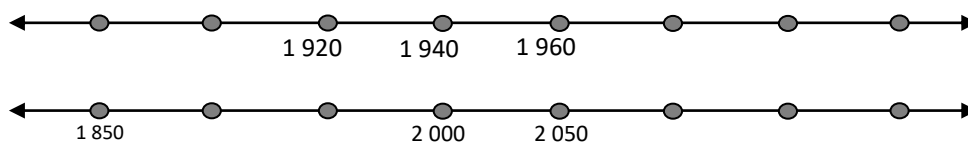
Memo a. 50 ; 100 ; 150 ; **200 ; 250 ; 300 ; 350 ; 400 ; 450 ; 500 ; 550**
 25 ; 50 ; 75 ; **100 ; 125 ; 150 ; 175 ; 200 ; 225 ; 250 ; 275 ; 300**

b. Increasing by 5 each time

Doubling (or multiplying by 2) each time

c. *Learners can create any pattern that follows a consistent rule and describe the rule.*

2.1.1(3) a. Complete.



()

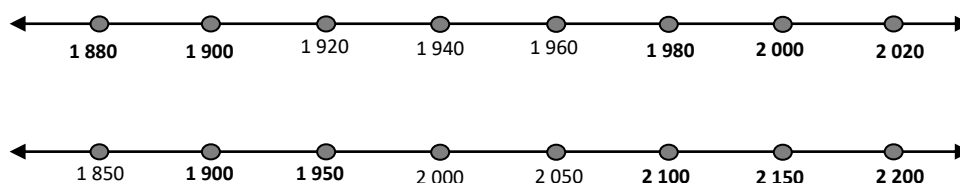
b. Complete and describe the pattern.

100 ; 96 ; 92 ; 88 ; _____ ; _____

88 ; 93 ; 98 ; _____ ; 108 ; _____

()

Memo: a.



b. 100 ; 96 ; 92 ; 88 ; **84 ; 80** Four is being taken away each time.

88 ; 93 ; 98 ; **103 ; 108 ; 113** Five is being added each time.

2.1.1(4) a. Write the next three numbers in the pattern and describe the pattern. ()

i) 1 450 ; 1 300 ; 1 150 ; ...

ii) $51\frac{1}{2}$; 51 ; $50\frac{1}{2}$; ...

iii) 4 ; 6 ; 7 ; 9 ; 10 ; 12 ; 13 ; ...

b. Fill in the missing numbers in these patterns.

i) _____ ; _____ ; 124 ; 144 ; _____ ; _____ ; _____

ii) 5 ; 25 ; _____ ; 625 ; 3 125 ; _____ ; _____

	<p>Memo: a. i) 1 000 ; 850 ; 700</p> <p>To find the next number, subtract 150 from the previous number.</p> <p>ii) 50 ; $49\frac{1}{2}$; 49</p> <p>To find the next number, subtract $\frac{1}{2}$ from the previous number.</p> <p>iii) 15 ; 16 ; 18</p> <p>To find the next number add 1, then add 2, then add 1, then add 2, etc.</p> <p>b. i) 84 ; 104 ; 124 ; 144 ; 164 ; 184 ; 204</p> <p>ii) 5 ; 25 ; 125 ; 625 ; 3 125 ; 15 625 ; 78 125</p>
2.1.1(5)	<p>a. Write the next three numbers in the pattern <u>and</u> describe the pattern.</p> <p>i) 1 000 000 ; 500 000 ; 250 000 ; ...</p> <p>ii) 1 ; 4 ; 9 ; 16 ; ... ()</p> <p>b. Describe TWO ways that this pattern could continue.</p> <p>2 ; 4 ; ()</p>
	<p>Memo: a. i) 125 000 ; 62 500 ; 31 250</p> <p>To find the next number, divide the previous number by 2 or multiply by $\frac{1}{2}$.</p> <p><i>Also accept 15 625 ; 3 906,25 ; 967,5625</i></p> <p>ii) 25 ; 36 ; 49</p> <p>To find the next number, add the next consecutive odd number OR to find the number, multiply the term number by itself.</p> <p>b. Add 2 to get the next number or multiply by 2 to get the next number.</p>
2.1.1(6)	<p>a. Write the next three numbers in the pattern <u>and</u> describe the pattern.</p> <p>i) 1 000 ; 250 ; $62\frac{1}{2}$; ...</p> <p>ii) 1 ; 1 ; 2 ; 3 ; 5 ; 8 ; ...</p> <p>iii) 100 ; 12 ; -76 ; ...</p>

- b. In a pattern of numbers, the next term is calculated by doubling the previous term and adding one. Write down any four consecutive numbers that could be found in this pattern.

Memo: a. i) $15\frac{5}{8}; 3\frac{29}{32}; \frac{125}{128}$ To find the next term, divide the previous term by 4 or multiply by $\frac{1}{4}$.

Also accept 15,625 ; 3,90625 ; 0,9765625

ii) 13 ; 21 ; 34

To find the next term add the previous two terms together.

iii) -164 ; -252 ; -340

To find the next term, subtract 88 from the previous term.

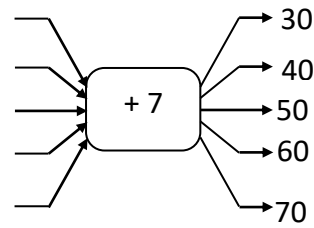
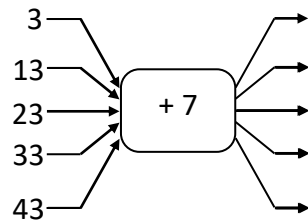
Negative numbers are not in the Intermediate Phase curriculum. This question is posed as a problem solving question to create awareness that there is a set of numbers less than 0.

- b. *There are several possible answers to this question. Some examples are:*

- 1 ; 3 ; 7 ; 15 ...
- 222 ; 445 ; 891 ; 1 783
- -5 ; -9 ; -17 ; -33
- $10\frac{1}{2}$; 22 ; 45 ; 91

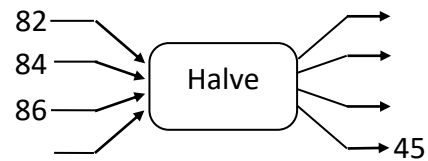
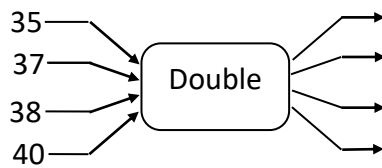
2.1.2 Input and output values

2.1.2(1) a. Complete.



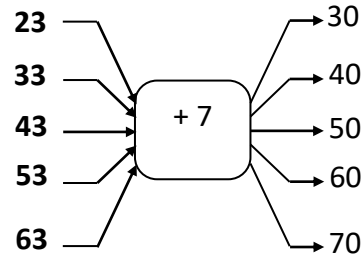
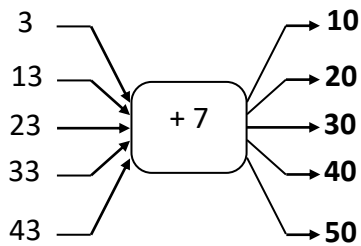
()

b. Complete.

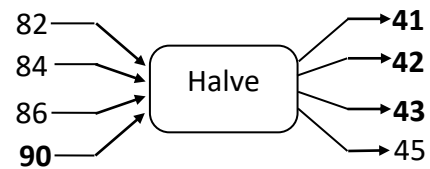
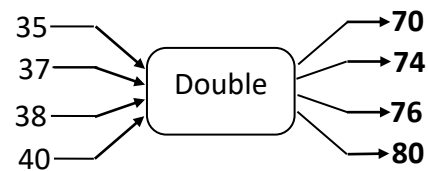


()

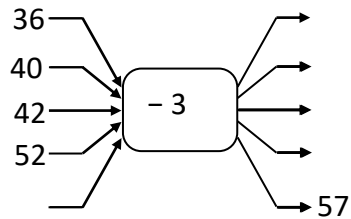
Memo a.



b.



2.1.2(2) a. Complete.



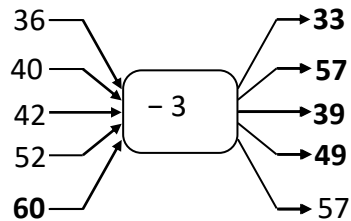
()

- b. A tricycle has 3 wheels. Complete the table.

Number of tricycles	1	2	3	4	5	6	10	20
Number of wheels								

()

Memo: a.



- b.

Number of tricycles	1	2	3	4	5	6	10	20
Number of wheels	3	6	9	12	15	18	30	60

- 2.1.2(3) a. Pete's taxi charges R22 for a trip AND another R2 per kilometre travelled.

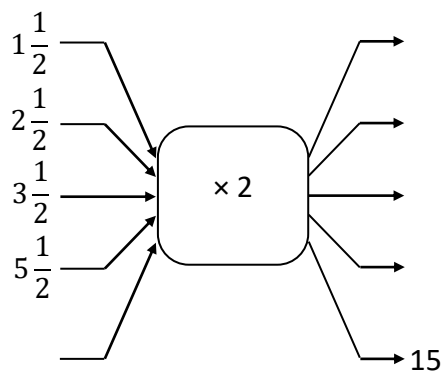
Complete the table.

Distance (km)	1	2	3	4	5	6	7	8	9	10
Cost (R)	24		28							

How much will it cost to travel 15 km in Pete's taxi?

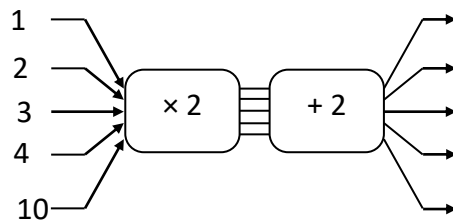
()

- b. Complete.



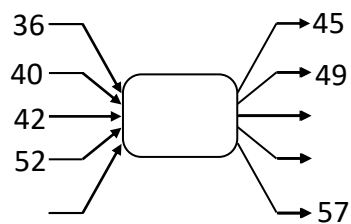
()

c. Complete.



()

d. Look carefully at the patterns in the input and output numbers. What do you think the operation should be? Complete the flow diagram.

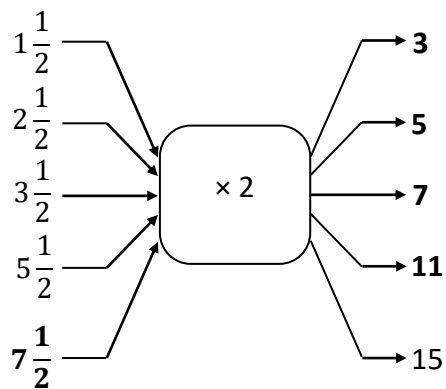


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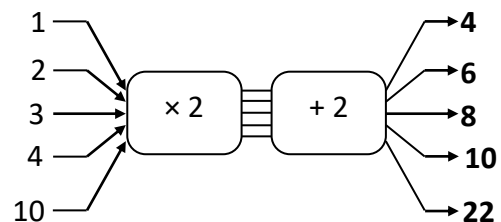
Memo: a.

Distance (km)	1	2	3	4	5	6	7	8	9	10
Cost (R)	24	26	28	30	32	34	36	38	40	42

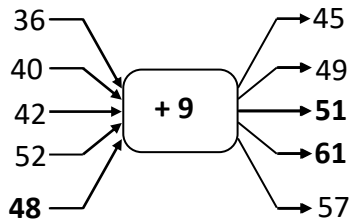
b.



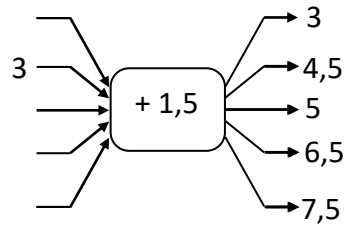
c.



d.

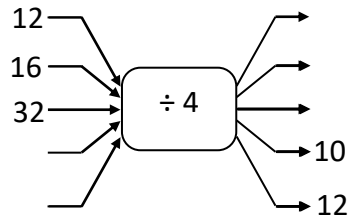


2.1.2(4) a. Complete.



()

b. Complete.



()

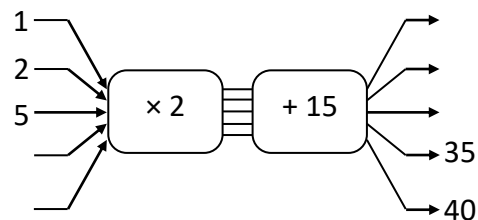
c. Mr. Jackson is taking his family camping. He pays R100 for the camping site AND then R40 per night that they stay there.

Complete the following table.

Number of nights	1	2	3			6	7	8	9
Cost (R)				260	300				

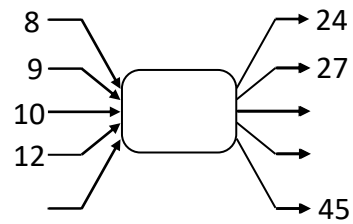
()

d. Complete.



()

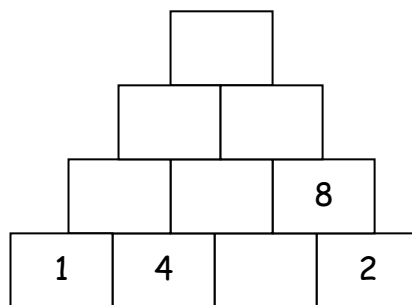
- e. Look carefully at the patterns in the input and output numbers. What do you think the operation should be? Complete the flow diagram.



()

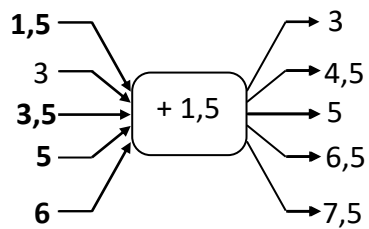
- f. Complete. The rule for the pyramid is:

Add the two numbers next to each other and double to get the number above.

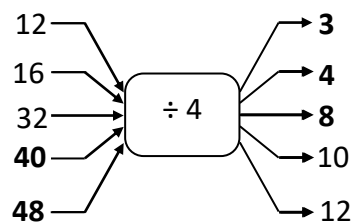


()

Memo: a.



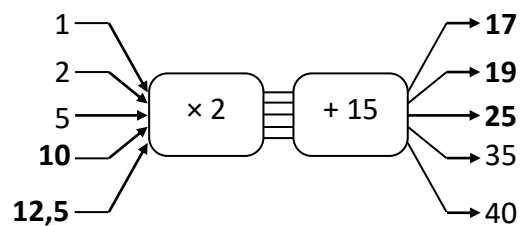
b.



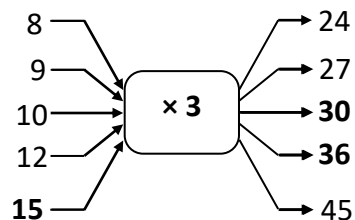
c.

Number of nights	1	2	3	4	5	6	7	8	9
Cost (R)	140	180	220	260	300	340	380	420	460

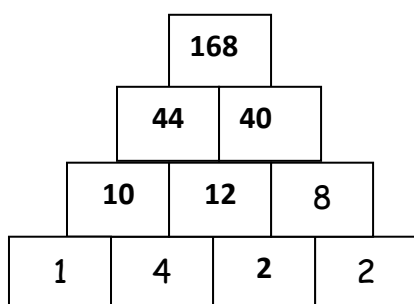
d.



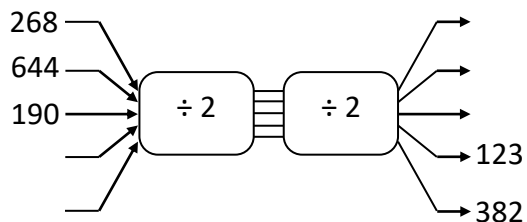
e.



f.



2.1.2(5) a. Complete.



()

b. A truck used to transport bags of wheat weighs 4 500 kg.

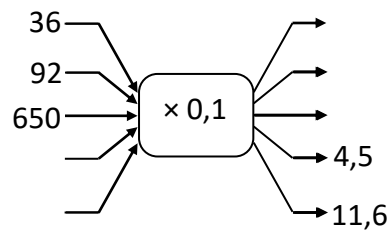
A bag of wheat weighs 50 kg.

Complete the table to calculate the total mass of the truck with wheat.

Number of bags of wheat	20	35	42	65	82	90	
Total mass (truck + bags) (kg)			6 600				9 500

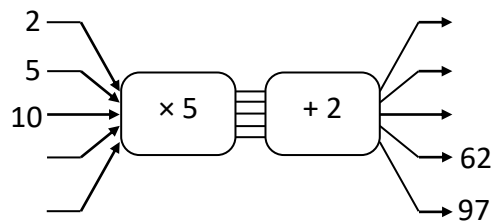
()

c. Complete.



()

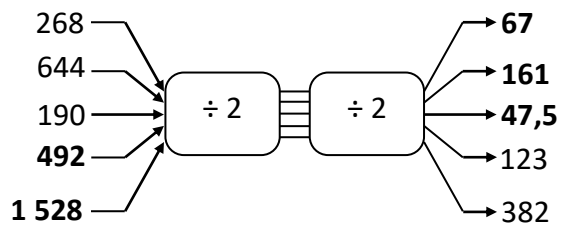
d. i) Complete.



ii) Explain how you calculated the input numbers when you were given the output numbers.

()

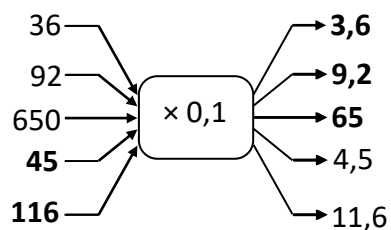
Memo: a.

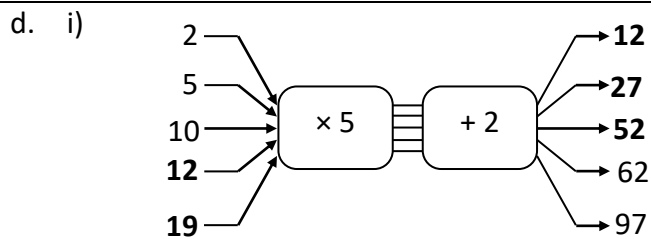


b.

Number of bags of wheat	20	35	42	65	82	90	100
Total mass (truck + bags) (kg)	5 500	6 250	6 600	7 750	8 600	9 000	9 500

c.





ii) You first subtract 2 and then you divide by 5.

2.1.2(6) a. Jack and Jill are saving money in a money tin.

Jack's mother gave him R20 on the first day and Jack adds R2 every day after that.

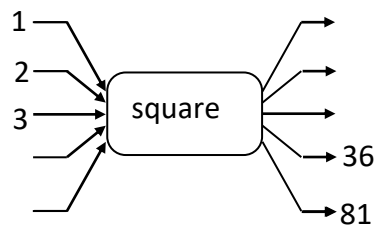
Jill puts R4 in the tin on the first day and every day after that.

i) Complete the table to show the amount of money that Jack and Jill have in their tin on each day.

Day	1	2	3	4	5	6	7	8	9	10
Amount – Jack (R)										
Amount – Jill (R)										

ii) How many days will it take for Jill to have more money than Jack? ()

b. Complete.



c. Use the rule $4n + 2$ to find the output value when:

i) $n = 5$

ii) $n = 120$

iii) $n = \frac{1}{8}$

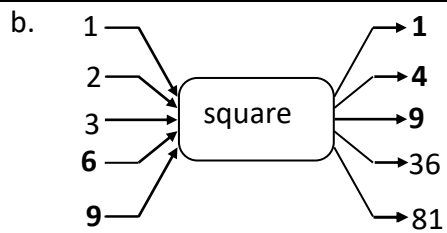
iv) $n = -5$

()

Memo: a. i)

Day	1	2	3	4	5	6	7	8	9	10
Amount – Jack (R)	20	22	24	26	28	30	32	34	36	38
Amount – Jill (R)	4	8	12	16	20	24	28	32	36	40

ii) 10 days.



c. i) 22

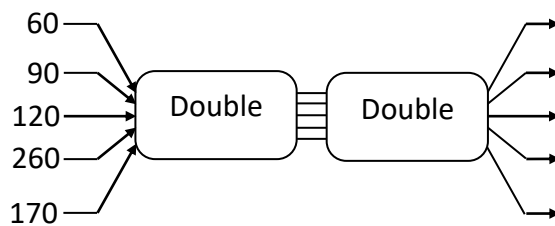
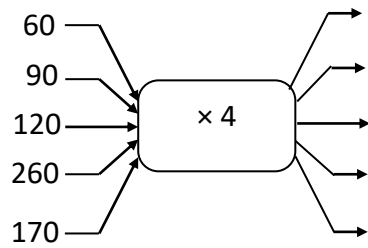
ii) 482

iii) $2\frac{1}{2}$ or 2,5

iv) -18

2.1.3 Equivalent forms

2.1.3(3) a. Complete.



Name one thing that is different in these two flow diagrams.

Name two things that are the same in these two flow diagrams.

()

b. There are 11 players in a soccer team.

i) Complete the table.

Number of teams	1	2	4	8	10	20	40
Number of players							

ii) Use your table to work out:

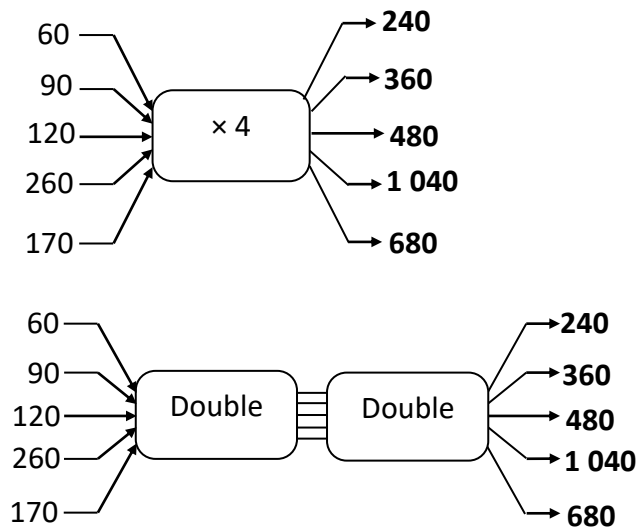
$$3 \times 11$$

$$12 \times 11$$

$$50 \times 11$$

()

Memo a.



You multiply by 4 in the first one and in the second one you double and double again.

The input and the output values are the same.

b. i)

Number of teams	1	2	4	8	10	20	40
Number of players	11	22	44	88	110	220	440

ii) $3 \times 11 = \mathbf{33}$

$12 \times 11 = \mathbf{132}$

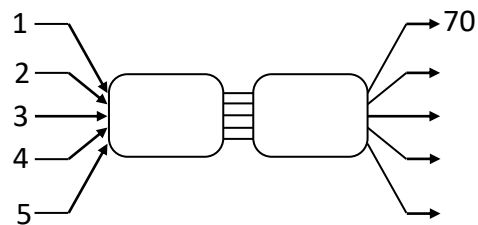
$50 \times 11 = \mathbf{550}$

- 2.1.3(4) a. Sarah's granny gives her a money box that has R50 in it. Sarah saves R20 each month that she puts in the box.

Complete the table to show how much money there will be in the box each month.

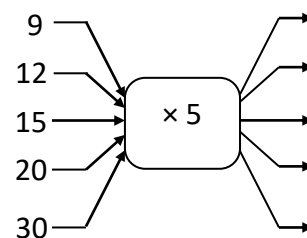
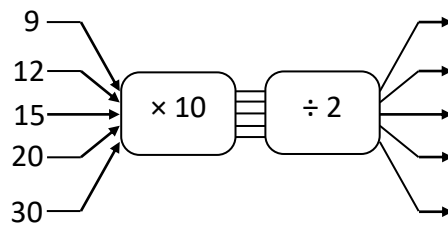
Number of months	0	1	2	3	4	5	6	7	8	9
Money in the box (R)										

Now, complete the flow diagram to show how it can be used to calculate Sarah's money.



()

- b. Complete.

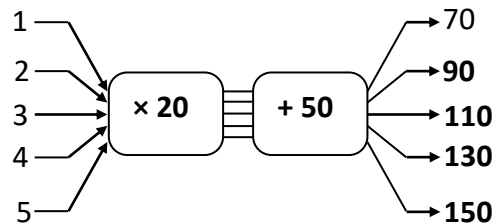


What do you notice?

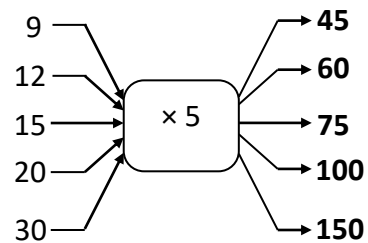
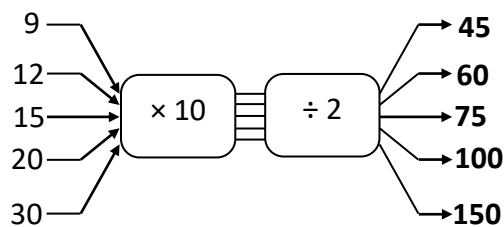
()

Memo: a.

Number of months	0	1	2	3	4	5	6	7	8	9
Money in the box (R)	50	70	90	110	130	150	170	190	210	230

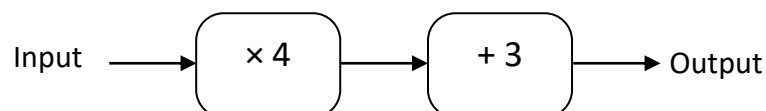


b.



The input and output values are the same. This means that multiplying by 10 and dividing by 2 is the same as multiplying by 5.

2.1.3(5) a. i) Complete the table using the rule in the flow diagram.



Input	5	6	7	10	15	20
Output						

- ii) By how much does the output number increase if the input number increases by 1?
- iii) By how much does the output number increase if the input number increases by 5?

()

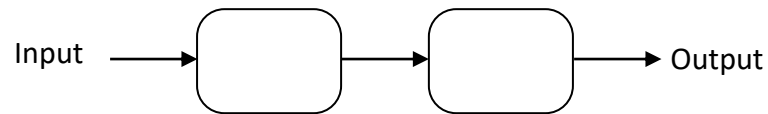
b. i) Complete.

		+1	+1	+1	+1	+5	+5	+10	+10
Input	6	7	8	9	10	15	20	30	40
Output			22	25	28	43	58	88	

+ ___ + ___ + ___ + ___ + ___ + ___ + ___ + ___

ii) By how much does the output number increase if the input number increases by 1?

iii) Complete.



()

Memo: a. i)

Input	5	6	7	10	15	20
Output	23	27	31	43	63	83

ii) 4

iii) 20

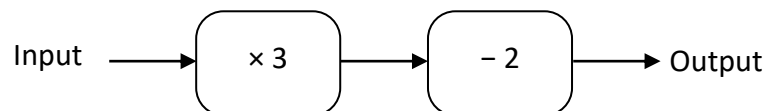
b. i)

		+1	+1	+1	+1	+5	+5	+10	+10
Input	6	7	8	9	10	15	20	30	40
Output	16	19	22	25	28	43	58	88	118

+3 +3 +3 +3 +15 +15 +30 +30

ii) 3

iii)

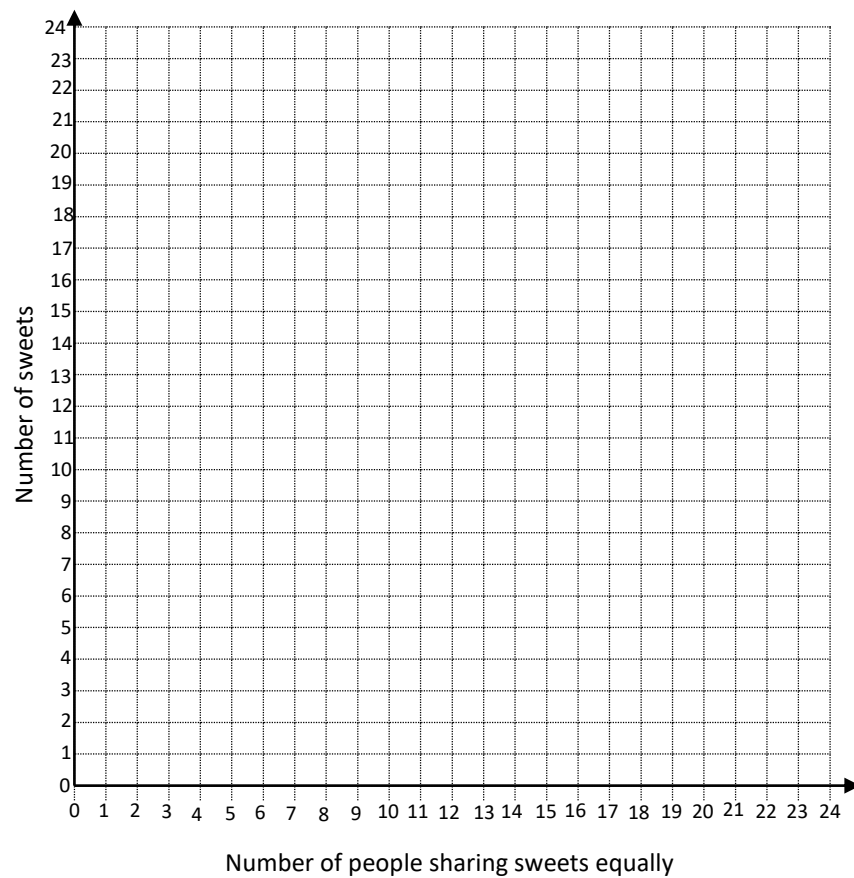


2.1.3(6) a. A bag of sweets has 24 sweets in it. The sweets are shared equally.

- i) The table shows the number of sweets each person will get depending on the number of people sharing. Complete the table to show all possibilities if the sweets are not broken.

Number of people sharing	1	2	3	4				
Number of sweets each person gets.				6				

- ii) Draw a graph of the values in the table.



()

- b. Complete the tables. Write a rule for each line, using \star to represent the input number in your rule.

Input	1	2	3	4	5	Flow diagram	Rule
Output	2	3	4				

Input	1	2	3	4	5	Flow diagram	Rule
Output	2			8			Output = $\star \times 2$

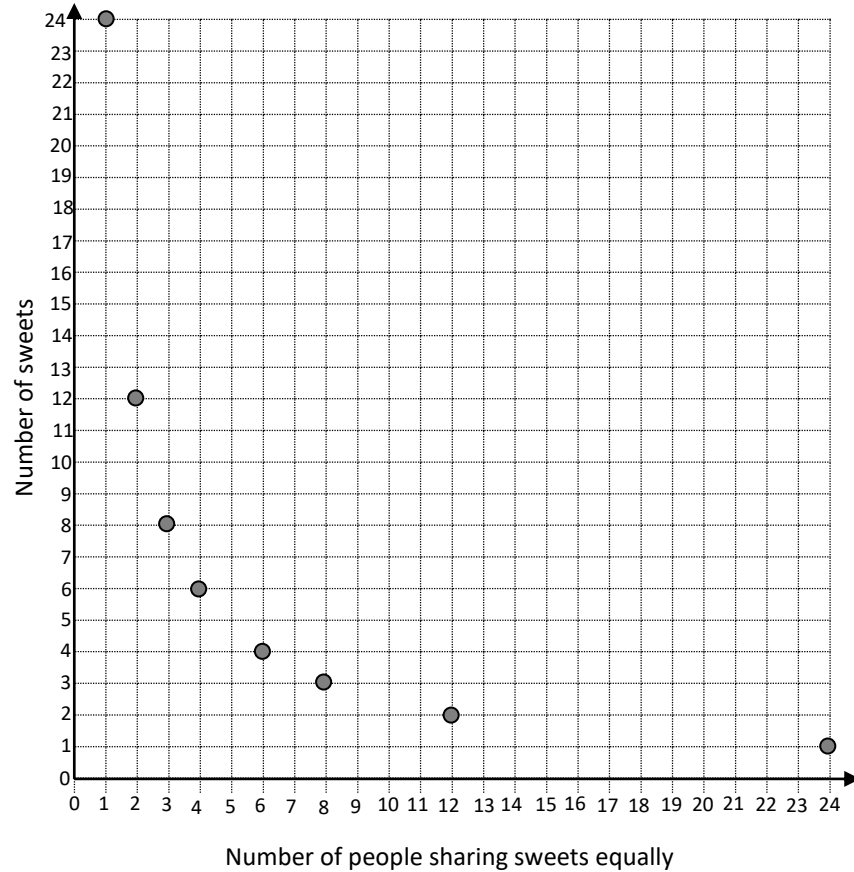
Input	1	2	3	4	5	Flow diagram	Rule
Output	4					Input \rightarrow $+1$ \rightarrow $\times 2$ \rightarrow Output	

()

Memo: a. i)

Number of people sharing	1	2	3	4	6	8	12	24
Number of sweets each person gets.	24	12	8	6	4	3	2	1

ii)



b.

Input	1	2	3	4	5	Flow diagram	Rule
Output	2	3	4	5	6	Input → $+1$ → Output	Output = $\star + 1$

Input	1	2	3	4	5	Flow diagram	Rule
Output	2	4	6	8	10	Input → $\times 2$ → Output	Output = $\star \times 2$

Input	1	2	3	4	5	Flow diagram	Rule
Output	4	6	8	10	12	Input → $+1$ → $\times 2$ → Output	Output = $(\star + 1) \times 2$

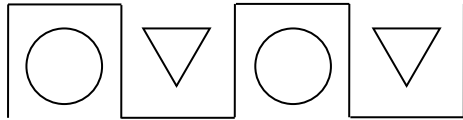
2.2 Geometric Patterns

2.2.1 Investigate and extend patterns

2.2.2 Input and output values

2.2.3 Equivalent forms

2.2.1(1) Extend the patterns.

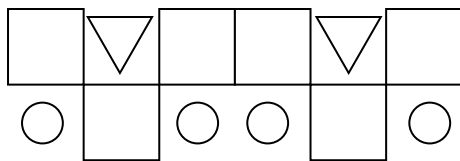


()

Memo

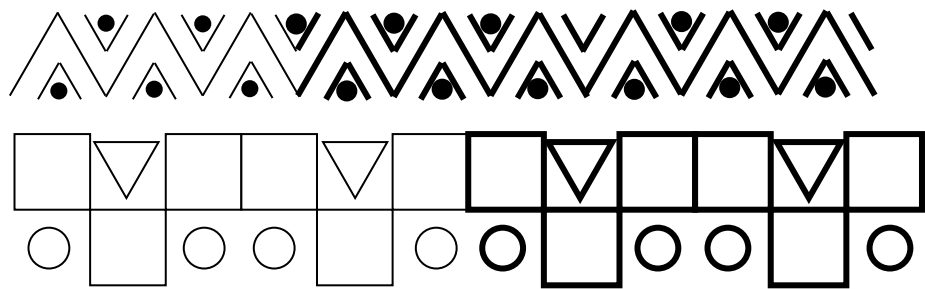


2.2.1(2) Extend the patterns.

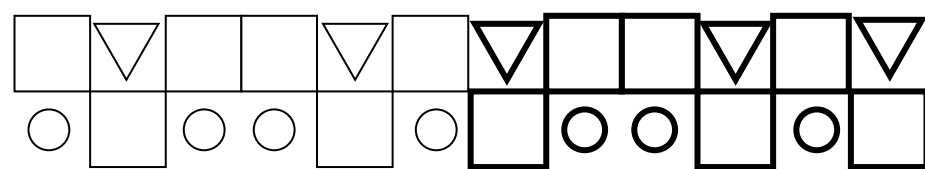


()

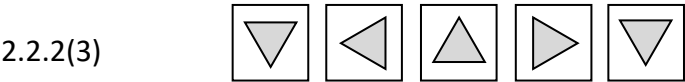
Memo



OR



2.2.1(3) a. Extend the pattern.



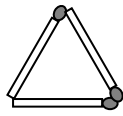
2.2.2(3)

2.2.3(3) Describe what you did to each picture to get the next picture in the pattern.

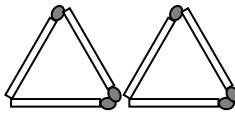
()

b. Look at this pattern of matchsticks:

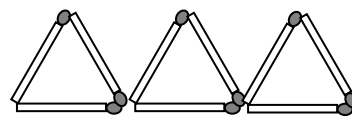
Picture 1



Picture 2



Picture 3



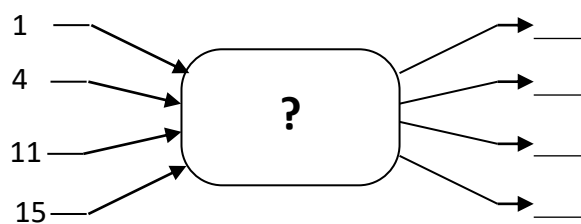
- i) Draw the next three pictures in the pattern.
- ii) Describe what you did to make the next picture.
- iii) Count the number of matchsticks in each picture and then complete the table.

Picture number	1	2	3	4	7	11
Number of matchsticks						

- iv) Copy and complete the flow diagram to work out the number of matches needed for each picture number.

Picture number

Number of matches

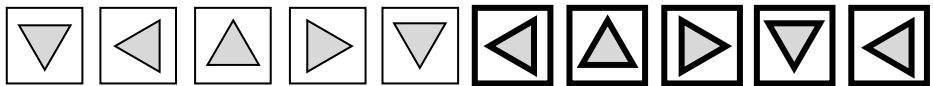


- v) Predict how many matches you would need to build Picture 50.
- vi) Describe how you can find the number of matches needed to build each picture.

()

Memo

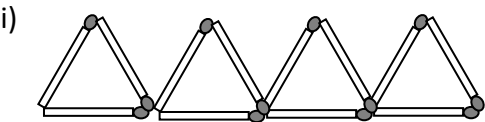
a.



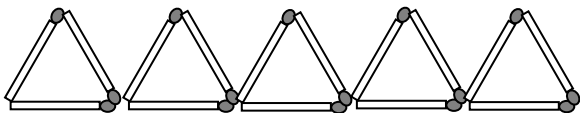
The triangle has done a quarter turn for each new block.

b.

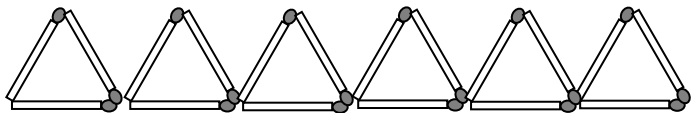
Picture 4



Picture 5



Picture 6

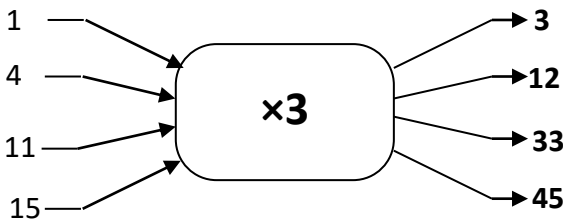


ii) You add a triangle using three matches to each new picture.

iii)

Picture number	1	2	3	4	7	11
Number of matchsticks	3	6	9	12	21	33

iv)



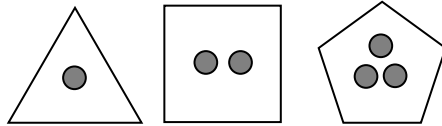
v) 150 matches.

vi) You multiply/times the picture number by 3 to work out the number of matches that you will need.

2.2.1(4) a. i) Draw the next three shapes in the pattern.

2.2.2(4)

2.2.3(4)



ii) In your own words, describe how the shapes change in the pattern.

()

b. i) Draw the next two pictures in the pattern.

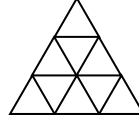
Picture 1



Picture 2



Picture 3



ii) Complete the table.

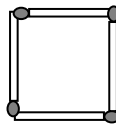
Picture number	1	2	3	4	5
Number of triangles					

iii) Explain how you would find the number of triangles in picture 6 and Picture 7 in the pattern.

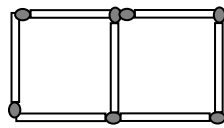
()

- c. Themba makes pictures with matches like this. The first 4 pictures make a pattern.

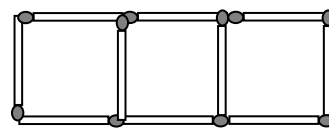
Picture 1



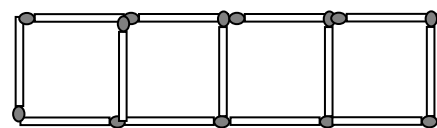
Picture 2



Picture 3



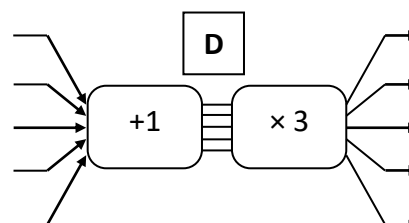
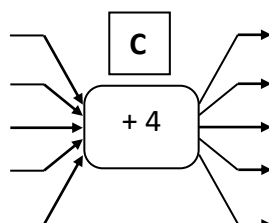
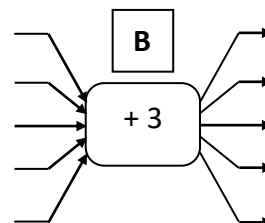
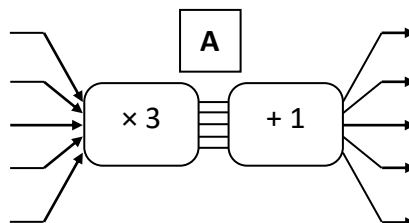
Picture 4



- Draw the 5th and 6th picture in Themba's pattern.
- In your own words, describe how the picture changes
- Complete the table for the number of matches in each picture.

Picture number	1	2	3	4	5	7	10	15	20
Number of matches									

- Which flow diagram can you use to find the number of matches needed for each picture?

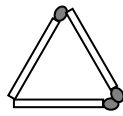


- Predict how many matches you would need to build Picture 100.

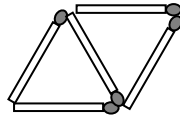
()

- d. Neba makes patterns with matches like this. The first three pictures make a pattern.

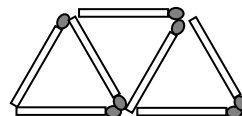
Picture 1



Picture 2



Picture 3

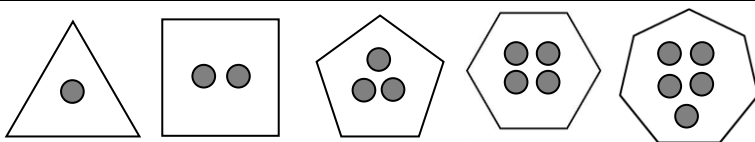


- i) Draw the next three pictures in the pattern.
- ii) Neba says, "I can work out the number of matches that I need for each picture by multiplying the picture number by 2 and adding one match".

Show that Neba is correct.

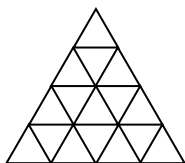
()

Memo a.

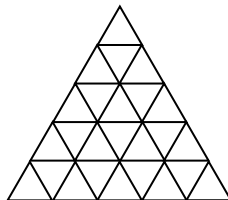


The number of sides of each shape increases by 1 and an extra dot is added in each new picture.

b. i) Picture 4



Picture 5

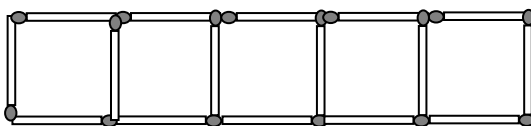


ii)

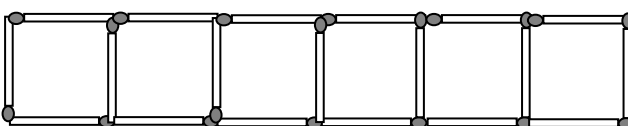
Picture number	1	2	3	4	5
Number of triangles	1	4	9	16	25

iii) You would add 11 to the number of triangles in Picture 5 to find the number of triangles in Picture 6, and then add another 13 triangles to find the number of triangles in Picture 7.

c. i) Picture 5



Picture 6



ii) Three matches are added to each new picture.

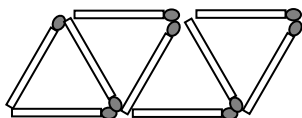
iii)

Picture number	1	2	3	4	5	7	10	15	20
Number of matches	4	7	10	13	16	22	31	46	61

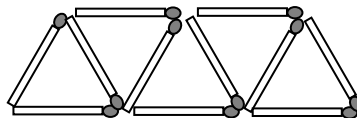
iv) A

v) 301 matches

d. i) Picture 4

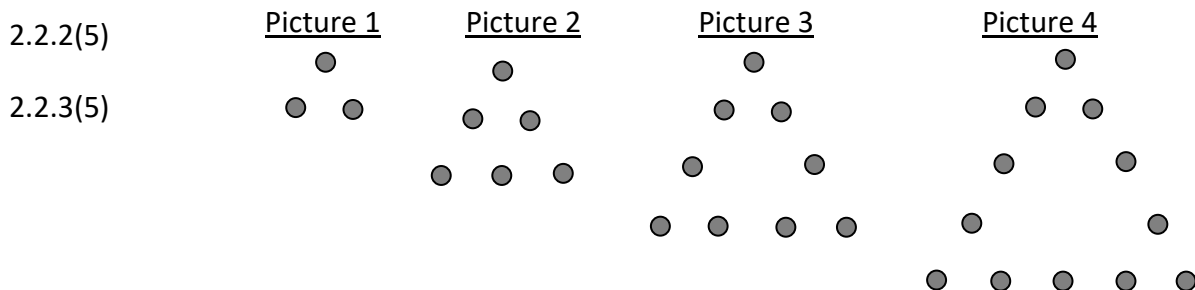


Picture 5



- ii) For Picture 1: $1 \times 2 + 1 = 3$ - correct
 For Picture 2: $2 \times 2 + 1 = 5$ - correct
 For Picture 3: $3 \times 2 + 1 = 7$ - correct
 For Picture 4: $4 \times 2 + 1 = 9$ - correct
 For Picture 5: $5 \times 2 + 1 = 11$ - correct

2.2.1(5) a. Adam makes pictures with dots. The first four pictures make a pattern.



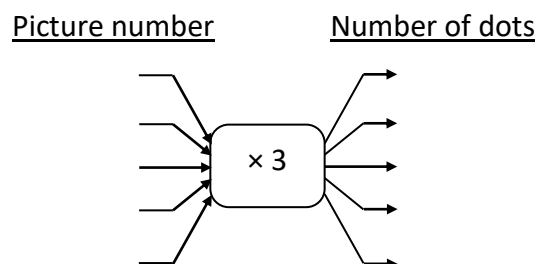
i) Draw the fifth and sixth picture in the pattern.

ii) Complete the table.

Picture number	1	2	3	4	5	7	10
Number of dots		6				21	

iii) How many dots will he need for picture 12?

iv) Suzi uses this flow diagram to calculate the number of dots in each picture.



Show that Suzi is correct.

v) Dan uses the number sentence:

$$\text{Number of dots} = (\text{Picture number} - 1) \times 3 + 3.$$

Is Dan correct? Explain how you know.

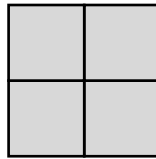
()

b. The first three pictures make a pattern.

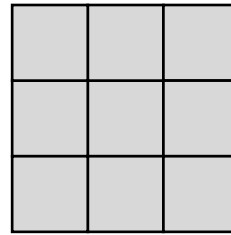
Picture 1



Picture 2



Picture 3



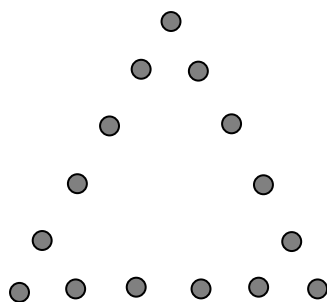
- i) Draw the next two pictures in the pattern.
- ii) Complete the table.

Picture number	1	2	3	4	5	6	7
Number of squares			9				

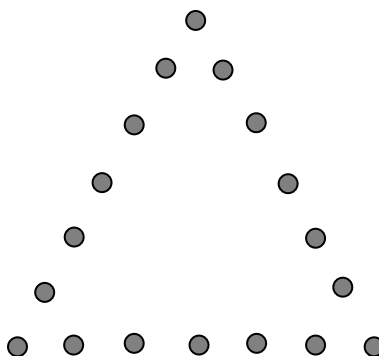
- iii) In your own words, describe how the number of squares change in each picture of the pattern.
- iv) How many squares would there be in Picture 10?

()

Memo a. i) Picture 5



Picture 6



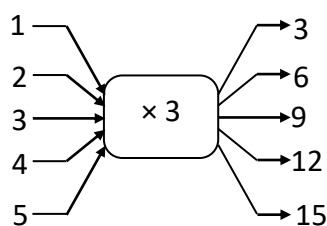
ii)

Picture number	1	2	3	4	5	7	10
Number of dots	3	6	9	12	15	21	30

iii) 36 dots

iv) Picture number

Number of dots



Suzi is correct because all the output values are the same as the number of dots in the pictures.

v) For picture 1: $(1 - 1) \times 3 + 3 = 3$

For Picture 2: $(2 - 1) \times 3 + 3 = 6$

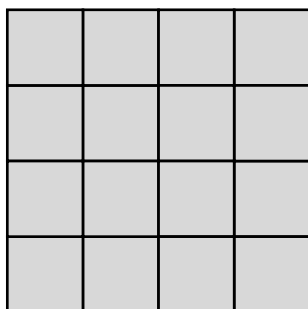
For Picture 3: $(3 - 1) \times 3 + 3 = 9$

For Picture 4: $(3 - 1) \times 3 + 3 = 12$

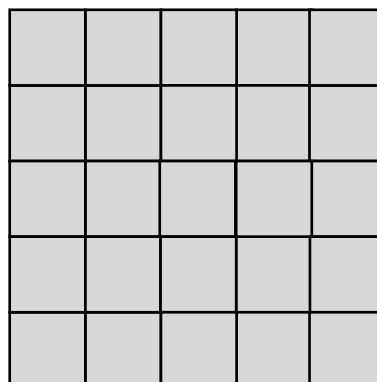
For Picture 5: $(3 - 1) \times 3 + 3 = 15$

Dan's method is also correct because the number of dots using his number sentence is the same as the picture.

b. i) Picture 4



Picture 5



ii)

Picture number	1	2	3	4	5	6	7
Number of squares	1	4	9	16	25	36	49

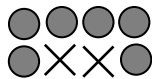
iii) The number of squares in each picture increases by consecutive odd numbers.

iv) 100 squares.

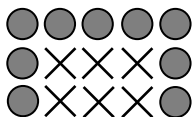
2.2.1(6) Anna draws pictures with dots and crosses. The first three pictures make a pattern.

2.2.2(6)

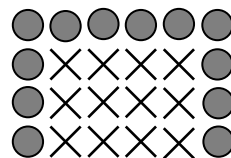
Picture 1



Picture 2



Picture 3



2.2.3(6)

i) Draw the fourth and fifth picture in the pattern.

ii) Describe the pattern in the pictures.

iii) Complete the table.

Picture number	1	2	3	4	5	6	7	9	12	15
Number of crosses										
Number of dots										

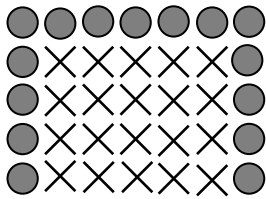
iv) In your own words, describe a rule that you can use to find the number of dots in each pattern.

v) In your own words, describe a rule that you can use to find the number of crosses in each pattern.

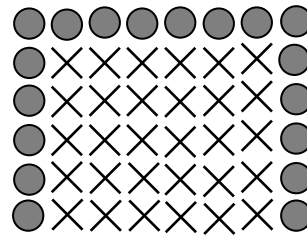
()

Memo i)

Picture 4



Picture 5



ii) The number of crosses increases by one column and one row. An extra dot is added to each column and the top row.

iii)

Picture number	1	2	3	4	5	6	7	9	12	15
Number of crosses	2	6	12	20	30	42	56	72	132	210
Number of dots	6	9	12	15	18	21	24	30	39	48

iv) Add 1 to the picture number and then multiply by the picture number (*or equivalent*)

v) Add 3 to the picture number and then add double the picture number (*or equivalent*)

2.3 Number sentences

2.3.1 Number sentences

2.3.1(1) a. Make the sides equal.

$$40 + 16 = \underline{\hspace{2cm}}$$

$$50 = \underline{\hspace{2cm}} + 10$$

$$20 + \underline{\hspace{2cm}} + 20 + 6 = 56$$

$$19 = 39 - \underline{\hspace{2cm}}$$

()

b. Circle the sentence that is FALSE.

$$2 \times 6 = 6 \times 2$$

$$6 + 2 = 2 \times 6$$

$$3 + 3 = 2 \times 3$$

$$2 + 2 + 2 = 3 \times 2$$

()

Memo: a. $40 + 16 = 56$

$$50 = \mathbf{40} + 10$$

$$20 + \mathbf{10} + 20 + 6 = 56$$

$$19 = 39 - \mathbf{20}$$

b. $2 \times 6 = 6 \times 2$

$$\mathbf{6 + 2 = 2 \times 6}$$

$$3 + 3 = 2 \times 3$$

$$2 + 2 + 2 = 3 \times 2$$

2.3.1(2) a. Make the sides equal in different ways

$$24 = \underline{\hspace{2cm}} \times \underline{\hspace{2cm}}$$

$$24 = \underline{\hspace{2cm}} \times \underline{\hspace{2cm}}$$

$$24 = \underline{\hspace{2cm}} \times \underline{\hspace{2cm}}$$

$$24 = \underline{\hspace{2cm}} \times \underline{\hspace{2cm}}$$

()

b. Circle the sentences that are TRUE.

$$8 \times 8 = 8 + 8$$

$$8 \times 2 = 20 - 4$$

$$8 \times 4 = 4 \times 8$$

$$8 \times 2 = 7 + 9$$

()

Memo: a. $24 = 1 \times 24$

$$24 = 2 \times 12$$

$$24 = 3 \times 8$$

$$24 = 4 \times 6$$

b. $8 \times 8 = 8 + 8$

$$8 \times 2 = 20 - 4$$

$$8 \times 4 = 4 \times 8$$

$$8 \times 2 = 7 + 9$$

2.3.1(3) a. Complete.

i) $8\,940 - \underline{\hspace{2cm}} = 8\,840$

ii) $9\,000 = 8\,940 + \underline{\hspace{2cm}}$

iii) $\frac{5}{7} - \underline{\hspace{2cm}} = \frac{2}{7}$

iv) $\frac{1}{8} + \underline{\hspace{2cm}} = \frac{1}{2}$

()

b. Make the sides equal.

i) $8\,940 - 940 = \underline{\hspace{2cm}} + 120$

ii) $8\,940 + \underline{\hspace{2cm}} = 9\,000 + 940$

iii) $\frac{1}{2} + \frac{1}{2} = \frac{1}{3} + \underline{\hspace{2cm}}$

()

Memo a. i) 100

ii) 60

iii) $\frac{3}{7}$

iv) $\frac{3}{8}$

b. i) 7 880

ii) 1 000

iii) $\frac{2}{3}$

2.3.1(4)	a. Complete.	i) _____ = 27 + 52	ii) 753 = 700 + _____ + 3	()
		iii) $2\frac{1}{3} + \text{_____} = 3$	iv) _____ = 124 + 42 + 33	
	b. Make the sides equal	i) $300 \times 48 = 10\,000 + 4\,000 + \text{_____}$	ii) $14\frac{3}{8} + \text{_____} = 3 \times 5$	()
		iii) $\frac{2}{3}$ of 60 = 23 + _____		
Memo:	a.	i) 79	ii) 50	
		iii) $\frac{2}{3}$	iv) 199	
	b.	i) 400	ii) $\frac{5}{8}$	iii) 17
2.3.2(5)	a. Complete.	i) R34,50 ÷ 50 = _____	ii) 3,1 + _____ = 4	()
		iii) 0,345 × _____ = 34,5	iv) _____ × 4 + 3 = 39	
		v) (14 + 2) × _____ = 1 920	vi) 60% of _____ = 54	
	b. Make the sides equal.	i) $\frac{1}{2}$ of 15 = 6,00 + _____	ii) 6 × _____ + 3 = 21 × 3	()
		iii) $86,8 \times 100 \div (49 + 13) = \frac{1}{2}$ of _____		
Memo:	a.	i) 0,69	ii) 0,9	
		iii) 100	iv) 9	
		v) 120	vi) 90	
	b.	i) 1,5 or 1,50	ii) 10	iii) 280

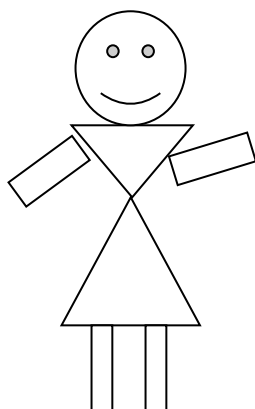
2.3.2(6)	a. Complete.	
	i) $\square \times 22 = 76,032$	ii) $22\% \text{ of } \square = 827,64$
	iii) $\sqrt{\square} = 9$	iv) $5^{\square} = 5 \times 5 \times 5 \times 5 \times 5 \times 5 \times 5$
	v) $-1 - \square = -10$	vi) $-8 - \square = 2$ ()
	b. Make the sides equal.	
	i) $1 = \square \times \square \times \square$	ii) $-4 + 2 = -2 \times \square$
	(Use the same number in each space)	
	()	
	iii) $0,2 \times \square = -4 \times -1$	iv) $25\% \text{ of } 120 = -\frac{1}{2} \times \square \times -5$
Memo:		
	a. i) 3,456	ii) 3 762
	iii) 81	iv) 7
	v) 9	vi) -10
	b. i) 1	ii) 1
	iii) 20	iv) 12

3. SPACE AND SHAPE (GEOMETRY)

3.1 Properties of 2-D Shapes

3.1.1 Characteristics of shapes

3.1.1(1) a. Draw this picture:



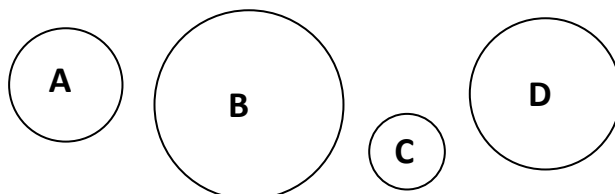
How many circles?

How many triangles?

How many rectangles?

()

b. Write from smallest to largest.

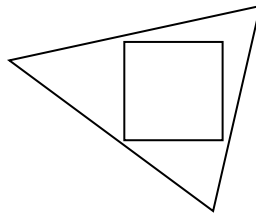


_____ ; _____ ; _____ ; _____

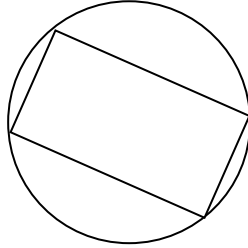
()

c. Which shape is bigger?

triangle or square

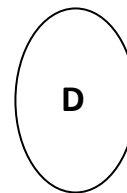
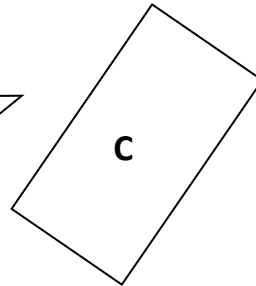
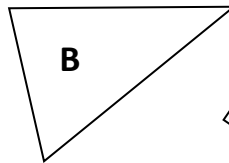
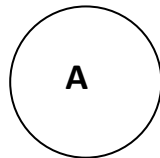


circle or rectangle



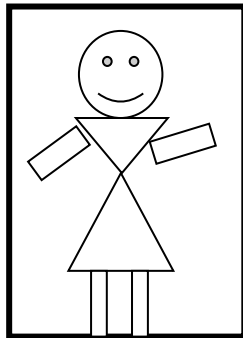
()

d. Which shapes have straight sides only?



()

Memo a.



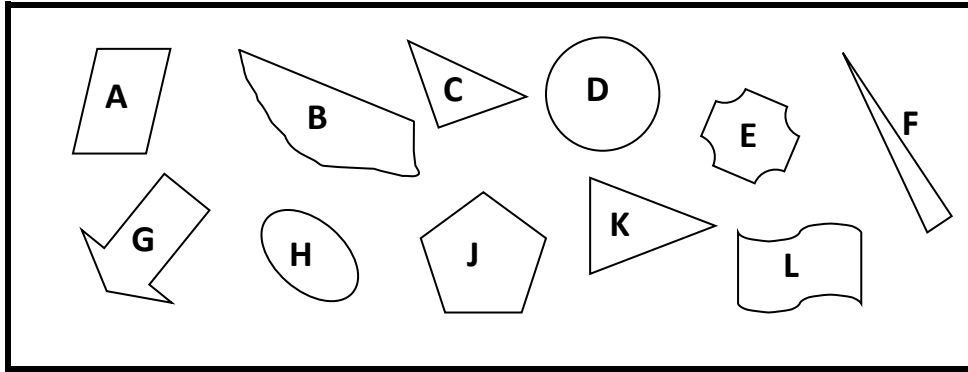
1 ; 2 ; 4

b. C, A, D, B

c. triangle ; circle

d. B and C

3.1.1(2) a.

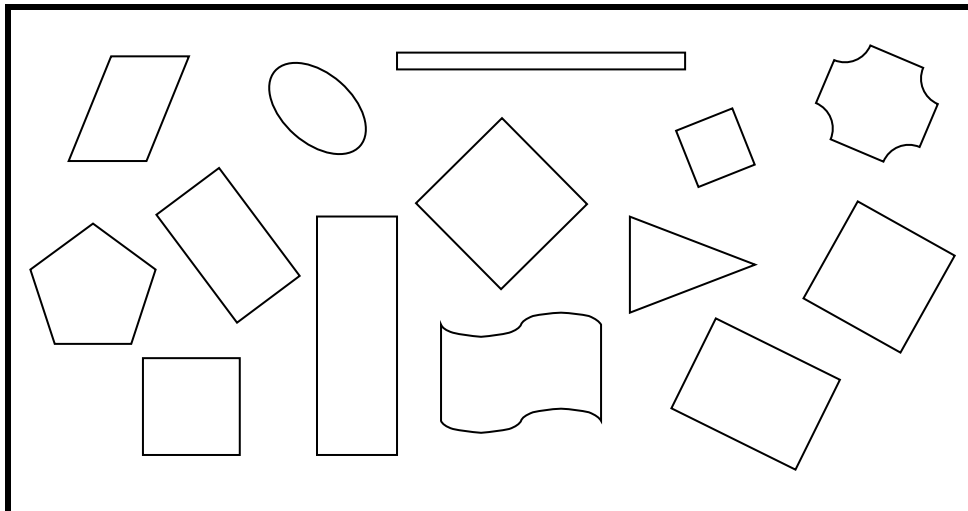


- i) Which shapes (A – L) have ONLY straight sides?
- ii) Which shapes have ONLY curved sides?
- iii) Colour the triangles in RED.
- iv) Colour the circle in BLUE

()

b. Colour the squares in red

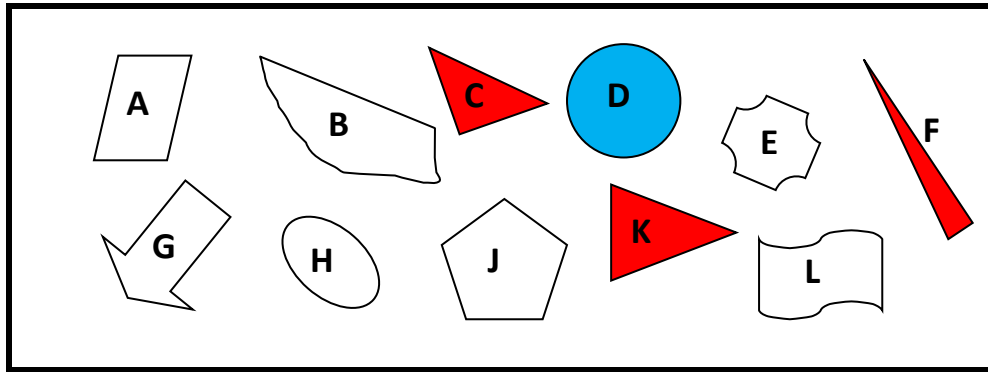
Colour the other rectangles in blue.



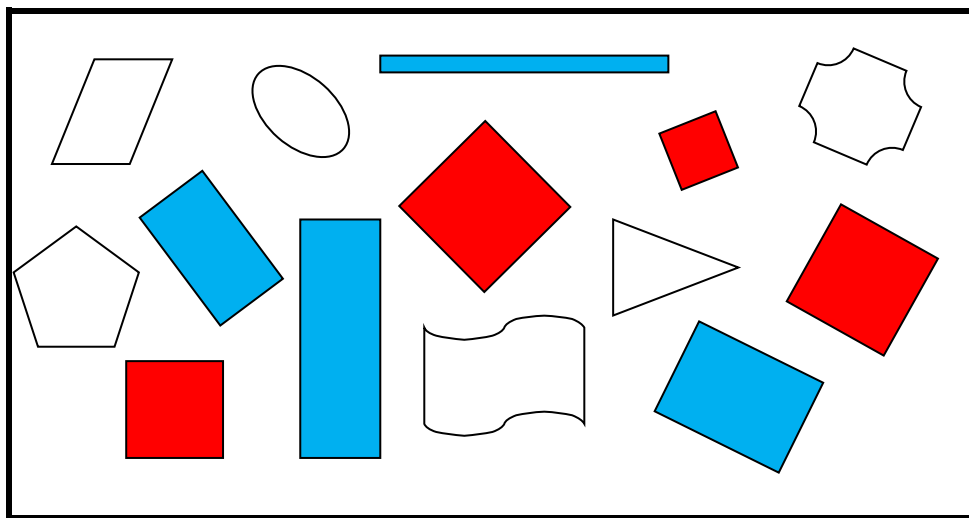
()

Memo a. i) A, C, F, G, J and K. ii) D and H

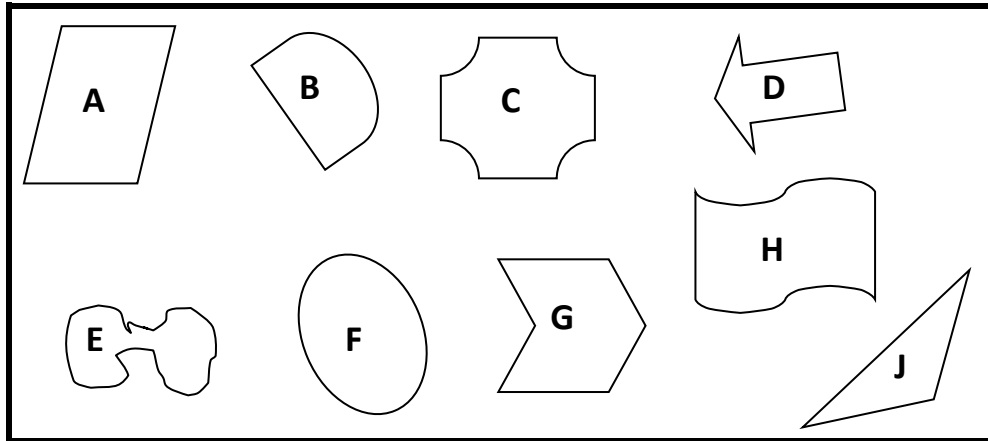
iii) and iv)



b.



3.1.1(3) a. Group the shapes in the table below.



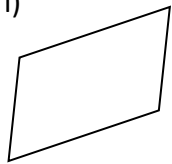
Only curved sides	Only straight sides	Curved and straight sides

()

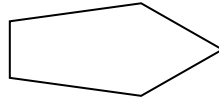
b. Name the shapes.

quadrilateral	pentagon	hexagon
---------------	----------	---------

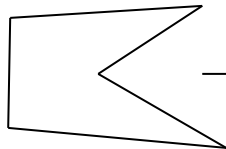
i)



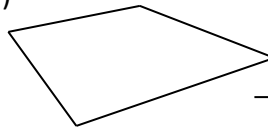
ii)



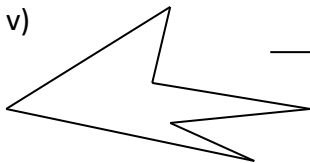
iii)



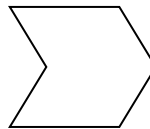
iv)



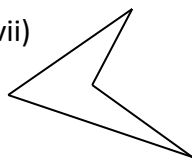
v)



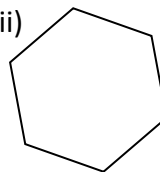
vi)



vii)



viii)



()

c. i) Draw a quadrilateral.

ii) Draw a triangle

iii) How many sides does a pentagon have?

iv) What do you call a closed shape with six straight sides?

()

Memo: a. Only curved sides: **E** and **F**

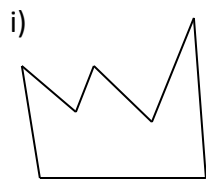
Only straight sides: **A** ; **D** ; **G** and **J**

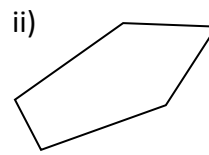
Curved and straight sides: **B** ; **C** and **H**

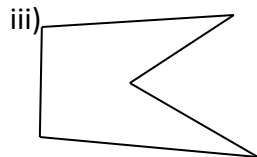
- b.
 - i) Quadrilateral
 - ii) Pentagon
 - iii) Pentagon
 - iv) Quadrilateral
 - v) Hexagon
 - vi) Hexagon
 - vii) Quadrilateral
 - viii) Hexagon
- c.
 - i) *Learners may draw any closed shape with four straight sides.*
 - ii) *Learners may draw any closed shape with three straight sides.*
 - iii) Five
 - iv) Hexagon

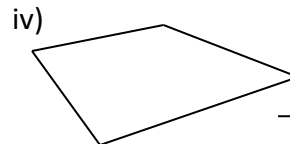
3.1.1(4) a. Name the shapes.

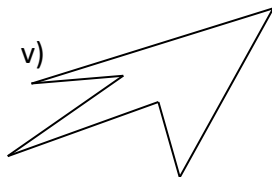
quadrilateral	pentagon	hexagon	heptagon
---------------	----------	---------	----------

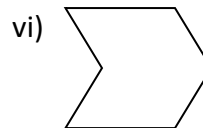


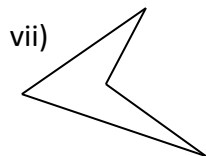


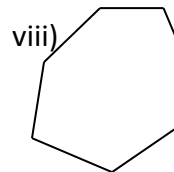






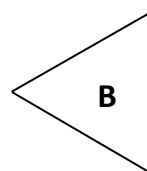
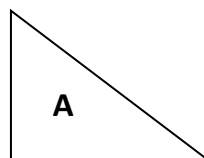






()

b. Look at A and B.



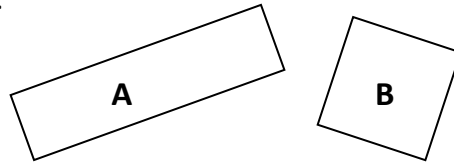
i) What is the same about the sides?

ii) Which has equal sides?

iii) Which has a right angle?

()

c. Look at shapes A and B.



i) What is the same about the sides?

ii) What is different about sides?

iii) What is the same about the angles?

iv) Shape B is a rectangle. What is its other name?

()

Memo: a. i) Heptagon

ii) Pentagon

iii) Pentagon

iv) Quadrilateral

v) Hexagon

vi) Hexagon

vii) Quadrilateral

viii) Heptagon

b. i) They both have three straight sides

ii) The lengths of the sides of shape B are all equal.

iii) A

c. i) They both have four straight sides.

ii) Shape B has 2 sides equal in length.

iii) All their angles are right angles.

iv) A square.

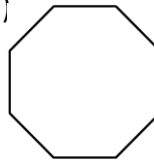
3.1.1(5) a. Name the shapes.

quadrilateral	pentagon	hexagon	heptagon	octagon
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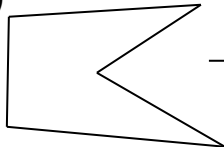
i)



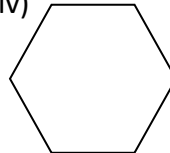
ii)



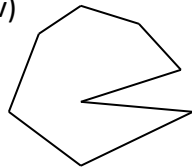
iii)



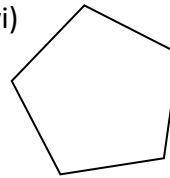
iv)



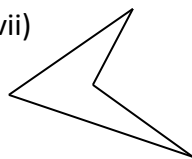
v)



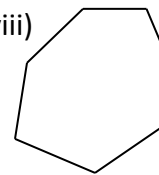
vi)



vii)

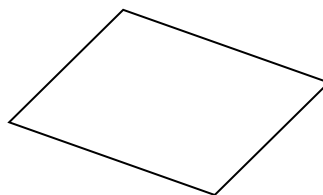


viii)



()

b. Look at this shape



i) How many sides?

ii) How many acute angles?

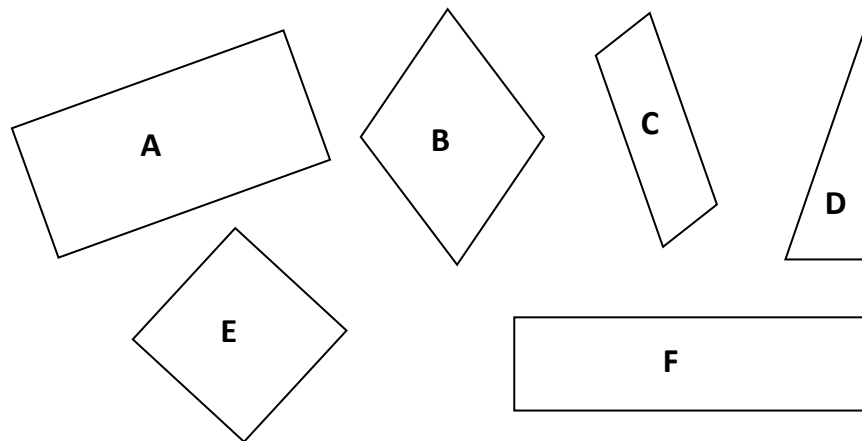
iii) How many obtuse angles?

iv) How many right angles?

v) What is this shape called?

()

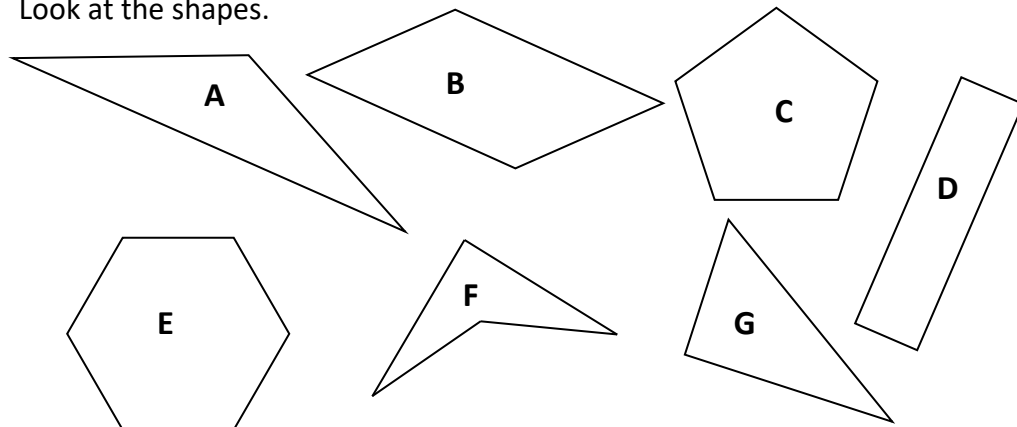
c. Look at these shapes.



- i) Which are squares?
- ii) Which are rectangles, but not squares?
- iii) Which are parallelograms, but not rectangles?

()

d. Look at the shapes.



- i) Which have one or more acute angle?
- ii) Which have one or more obtuse angles?
- iii) Which have one or more right angles?
- iv) Which have one or more reflex angles?
- v) What is the name of shape B?

()

- Memo**
- a.
 - i) Heptagon
 - ii) Octagon
 - iii) Pentagon
 - iv) Hexagon
 - v) Octagon
 - vi) Pentagon
 - vii) Quadrilateral
 - viii) Heptagon

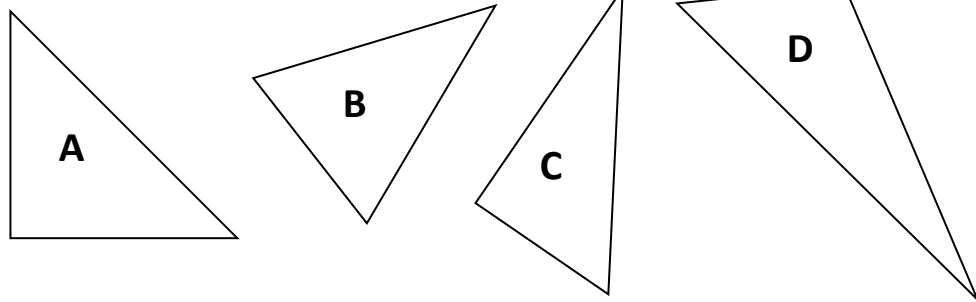
- b.
 - i) 4
 - ii) 2
 - iii) 2
 - iv) 0
 - v) parallelogram

- c.
 - i) E
 - ii) A ; F
 - iii) B ; C

- d.
 - i) A ; B ; F ; G
 - ii) A; B; C ; E
 - iii) D ; G
 - iv) F
 - v) parallelogram

- 3.1.1(6) a.
- A triangle with three acute angles is called an *acute-angled triangle*
 - A triangle with one right angle and two acute angles is called a *right-angled triangle*
 - A triangle with two sides equal in length is called an *isosceles triangle*

Look at these triangles.



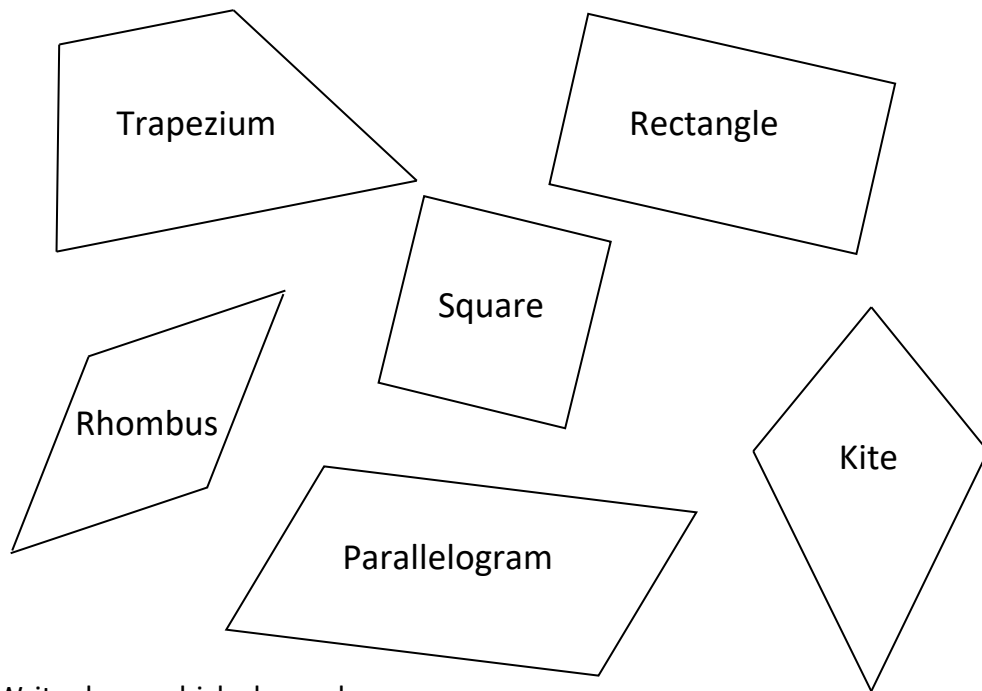
- i) Which are acute-angled triangles?
- ii) Which are right-angled triangles?
- iii) Which are isosceles triangles?

()

- b.
- A *right-angled triangle* has one right angle.
 - An *isosceles triangle* has two sides equal in length.
 - An *obtuse-angled triangle* has one obtuse angle.
- i) Can a right-angled triangle have an obtuse angle? Draw a picture to explain your answer.
 - ii) Can a triangle have two obtuse angles? Draw a picture to explain your answer.
 - iii) Can an isosceles triangle also be an obtuse-angled triangle? Draw a picture to explain your answer.

()

- c. Use a ruler and protractor to measure the sides and angles of these special quadrilaterals.



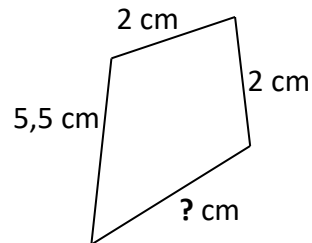
Write down which shapes have:

- i) Only one pair of opposite sides parallel
- ii) Two pairs of opposite sides parallel
- iii) All four sides equal
- iv) Two pairs of opposite sides equal
- v) Two pairs of adjacent (next to each other) sides equal.

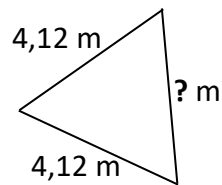
()

- d.
- An *equilateral triangle* has three sides equal in length
 - A *rhombus* has four sides equal in length
 - A *kite* has two pairs of adjacent sides equal in length

i) What is the length of the missing side of this kite? *Not drawn to scale.*



ii) What is the length of the missing side of this equilateral triangle? *Not drawn to scale*



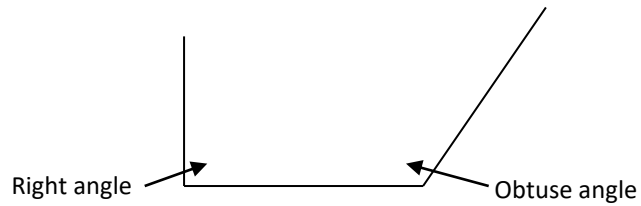
()

Memo a. i) B

ii) A and C

iii) A and B

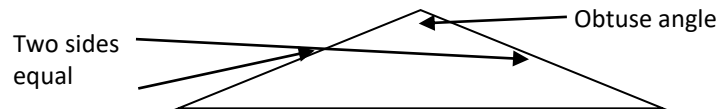
b. i) No. *An example of picture*



ii) No. *An example of picture*



iii) Yes. *An example of picture*



c. i) Trapezium

ii) Rectangle, square, rhombus and parallelogram

iii) Rhombus and square

iv) Rectangle, parallelogram, square and rhombus

v) Kite

d. i) 5,5 cm

ii) 4,12 m

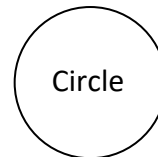
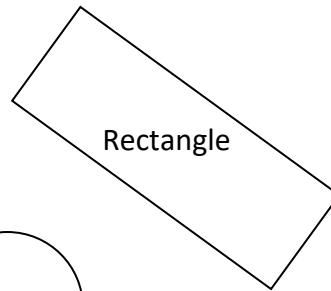
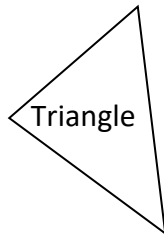
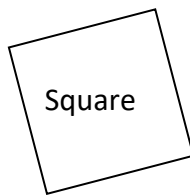
3.1.2 Further activities

3.1.2(2) Draw:

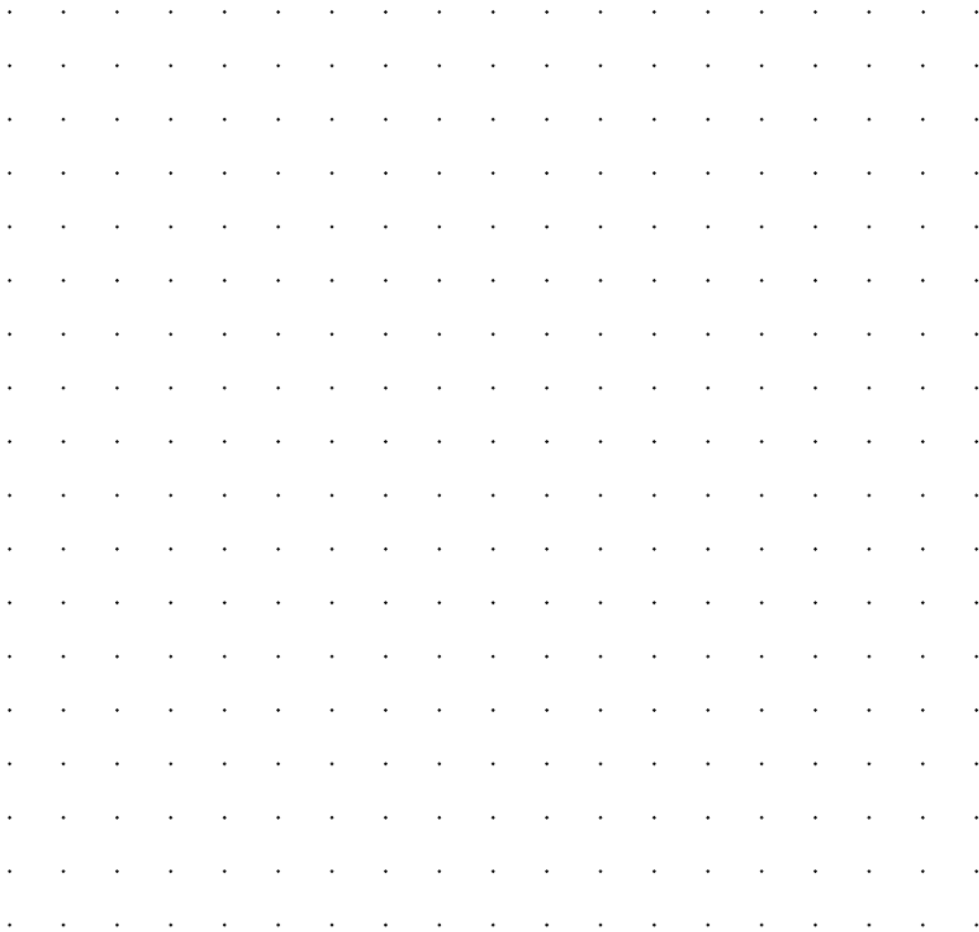
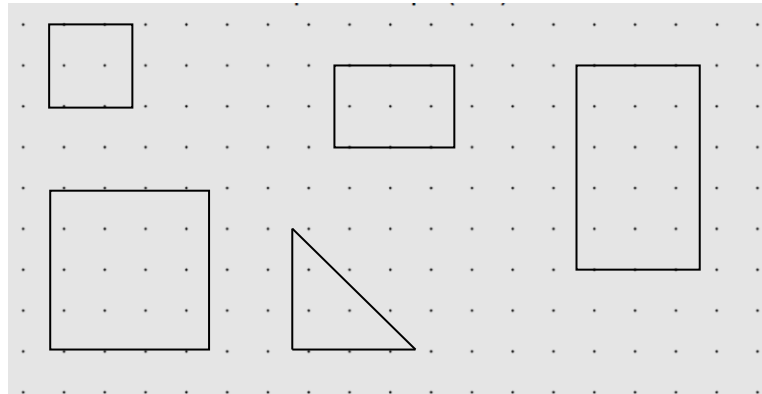
- A square
- A triangle
- A rectangle that is not a square
- A circle.

()

Memo *Size and orientation do not matter. Examples:*

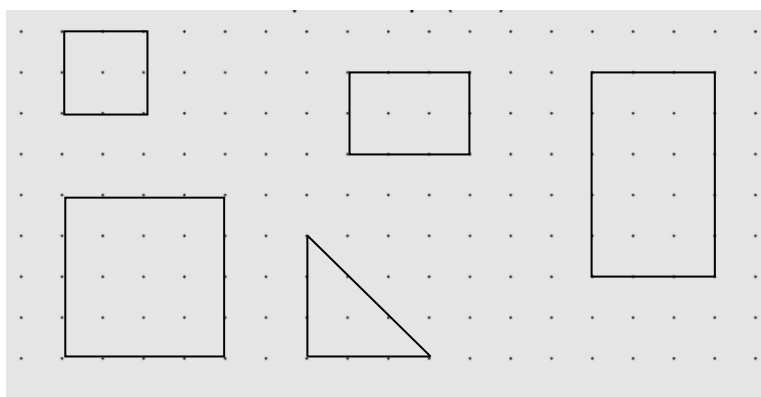


3.1.2(3) Copy these shapes on the dotted paper below.

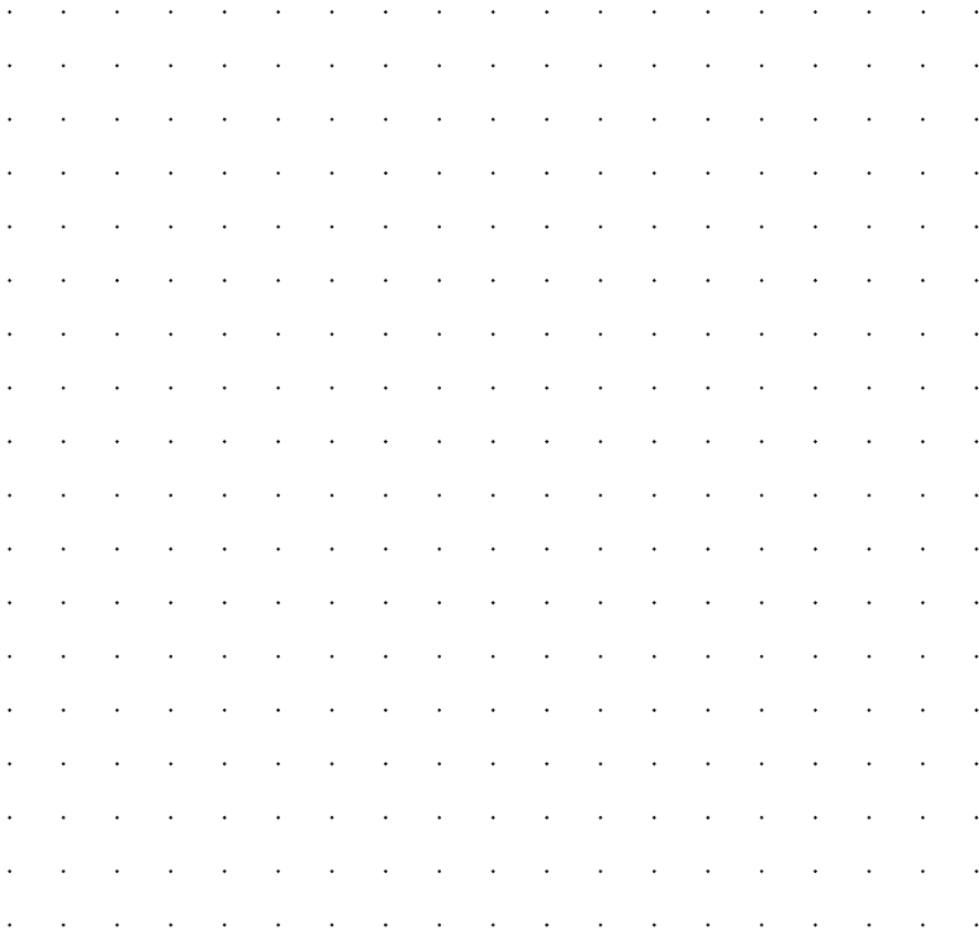
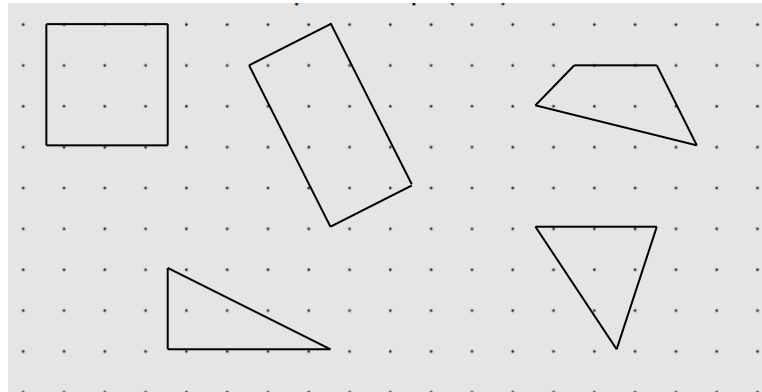


()

Memo: *The position on the dotty space is not important, but the size and orientation must be correct.*

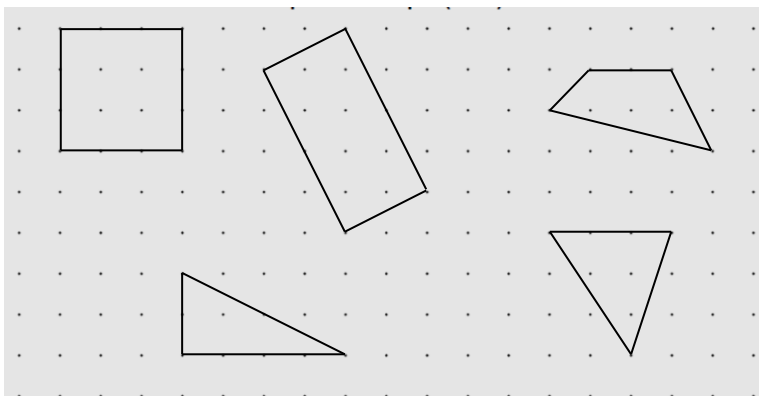


3.1.2(4) Copy these shapes on the dotted paper below.

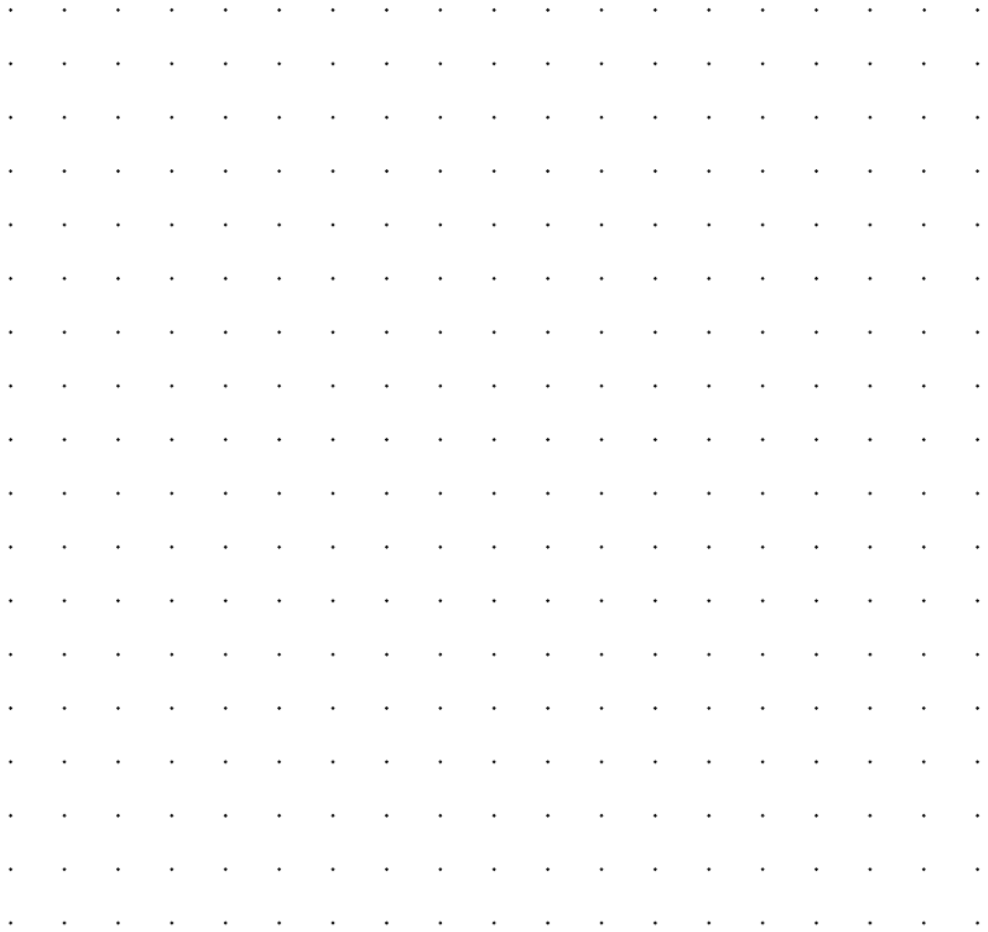
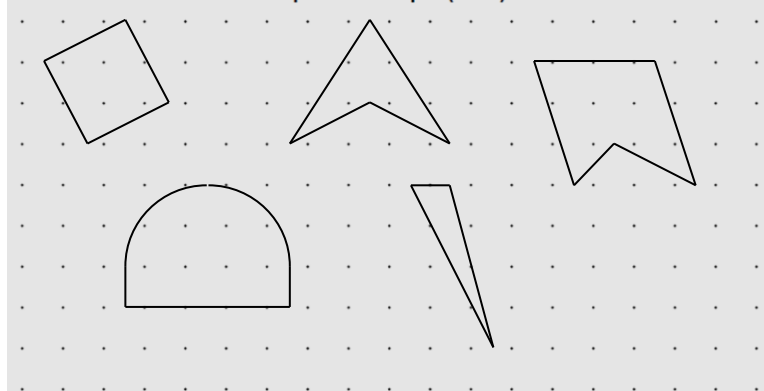


()

Memo: *The position on the dotty space is not important, but the size and orientation must be correct.*

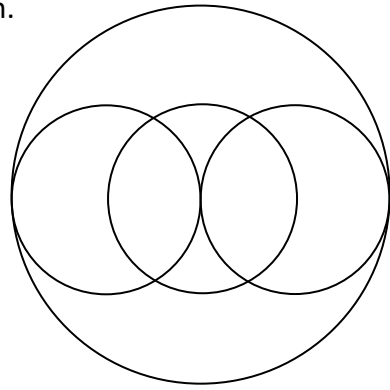


3.1.2(5) a. Copy these shapes on the dotted paper below.

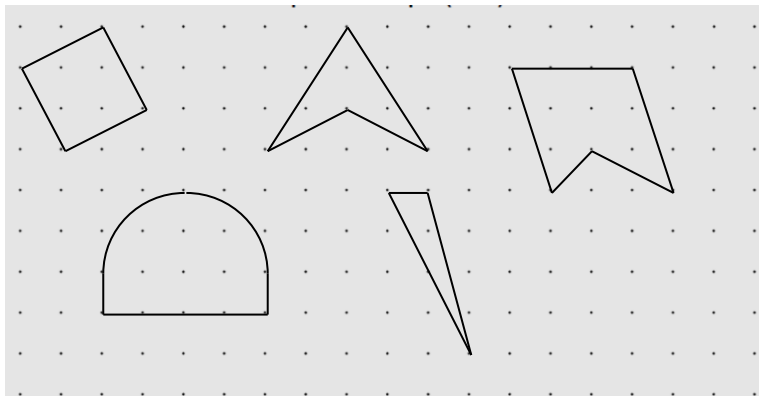


()

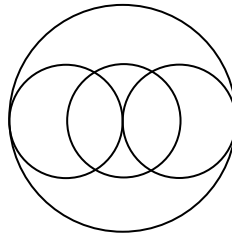
- b. Use a pair of compasses to draw this pattern.



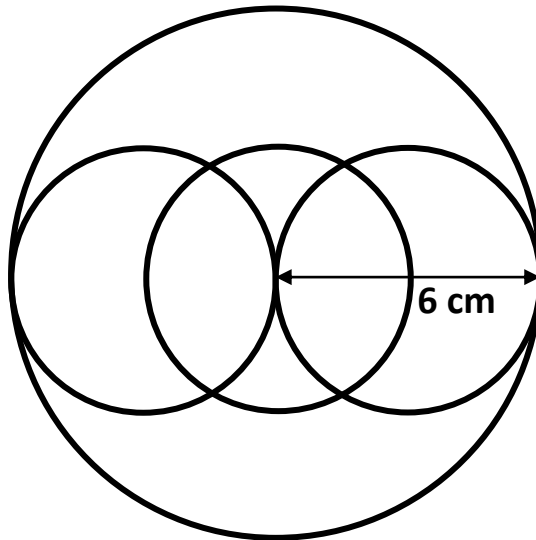
Memo: a. *The position on the dotty space is not important, but the size and orientation must be correct.*



- b. *Size does not matter*



3.1.2(6) Use a ruler and a pair of compasses to draw this pattern according to the given measurements.



()

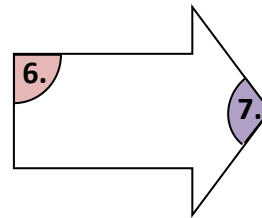
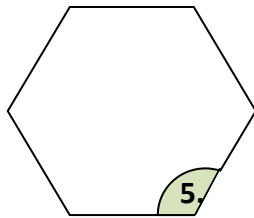
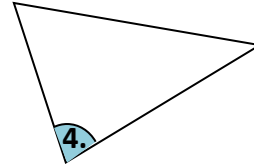
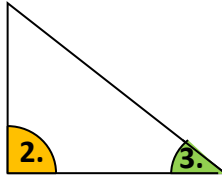
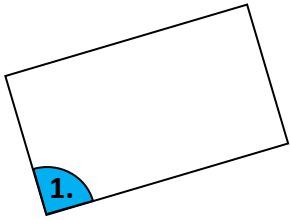
Memo: *Suggested marking technique:*

*Accurately construct the pattern on a plastic sleeve or overhead transparency.
Lay the sleeve or transparency over the learner's pattern to check for accuracy.*

3.1.3 Angles

3.1.3(4) For each of the angles (1 – 7), write whether they are:

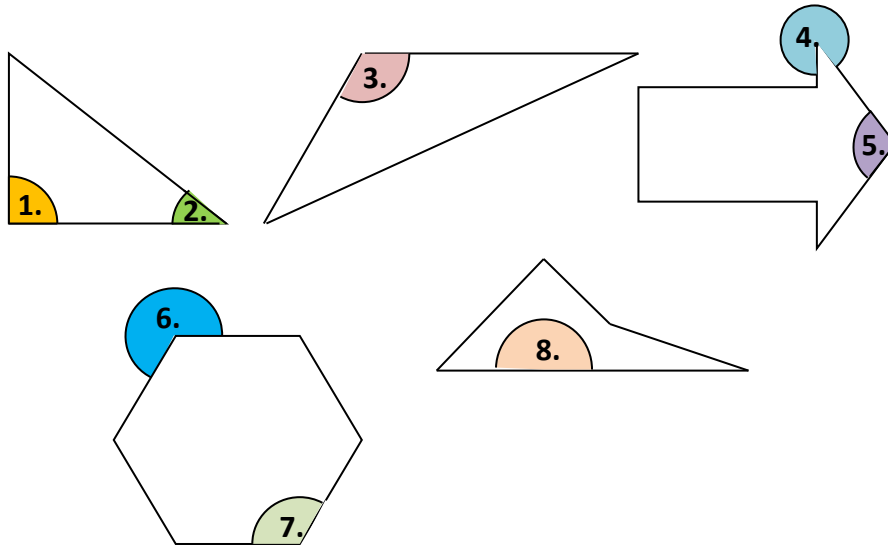
- a right angle
- smaller than a right angle
- or greater than a right angle



()

- Memo:**
1. Right-angle
 2. Right-angle
 3. Smaller than a right-angle
 4. Smaller than a right-angle
 5. Greater than a right-angle
 6. Right-angle
 7. Greater than a right -angle

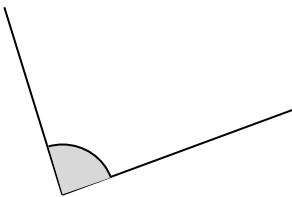
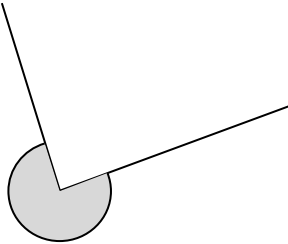
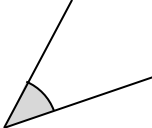
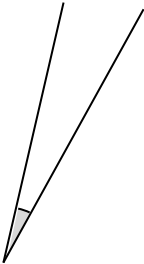
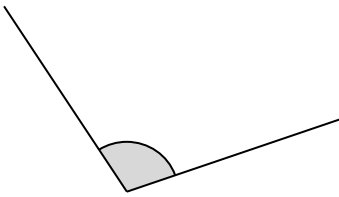
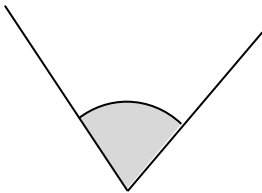
3.1.3(5) Write down if the angles are acute, right, obtuse, straight or reflex.



()

- Memo:**
1. Right-angle
 2. Acute-angle
 3. Obtuse-angle
 4. Reflex angle
 5. Obtuse-angle
 6. Reflex angle
 7. Obtuse angle
 8. Straight angle

3.1.3(6) Compare angle A and angle B. Which angle is bigger?

	A	B
i)		
ii)		
iii)		

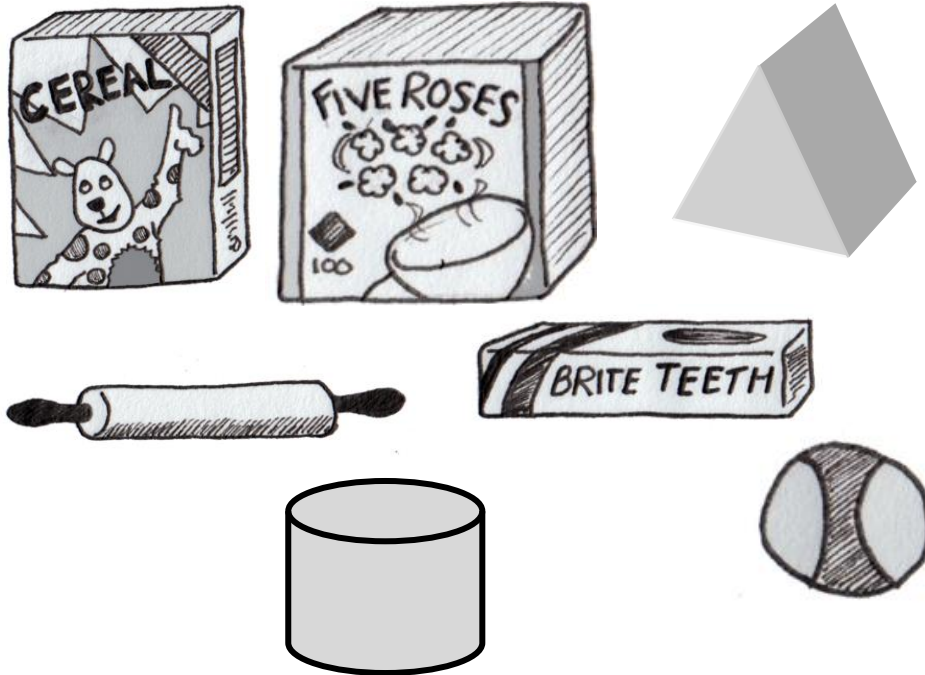
()

Memo i) B
ii) A
iii) A

3.2 Properties of 3-D Objects

3.2.1 Characteristics of Objects

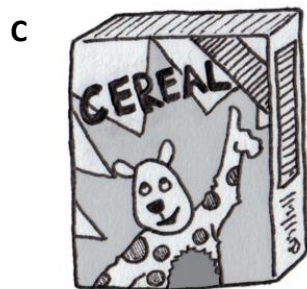
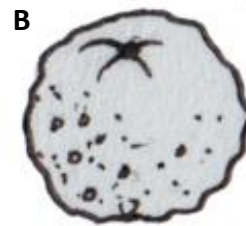
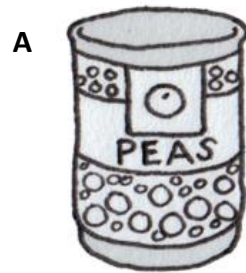
3.2.1(1) a. Circle the objects that can roll.



()

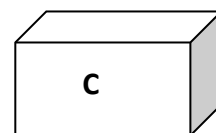
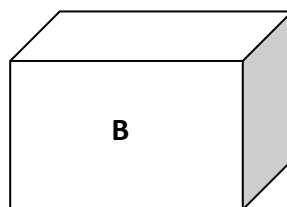
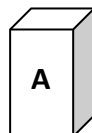
b. Name the objects A to F. Choose from these names.

ball-shaped	box-shaped	cylinder
-------------	------------	----------



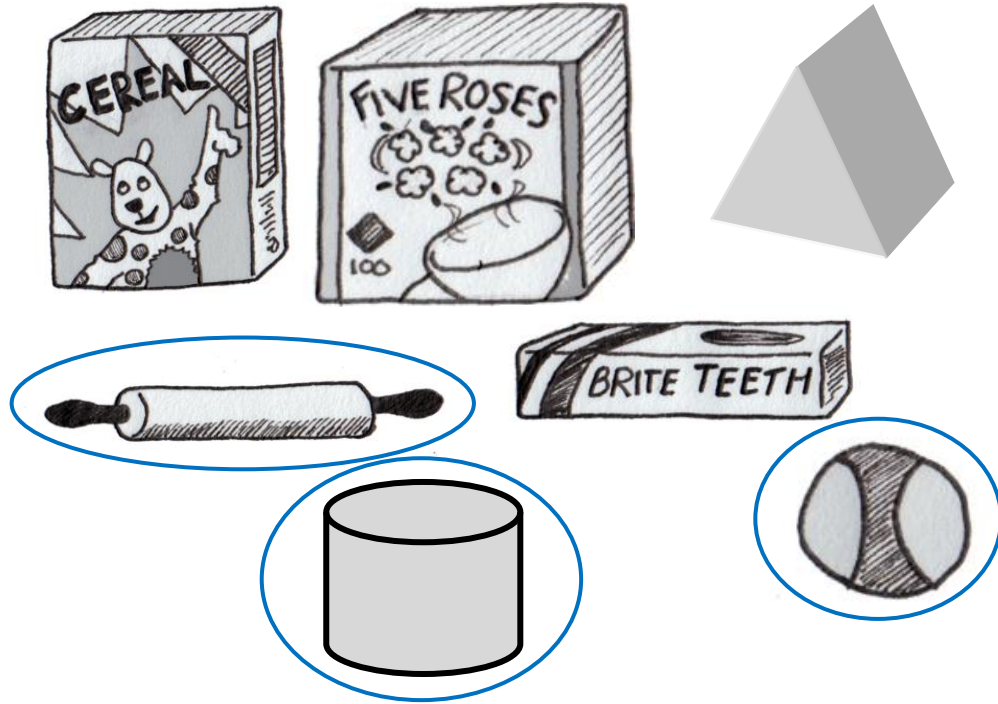
()

c. Write these objects (A – C) in order from smallest to largest.



()

Memo: a.



b. A. cylinder

B. ball-shaped

C. box-shaped

D. cylinder

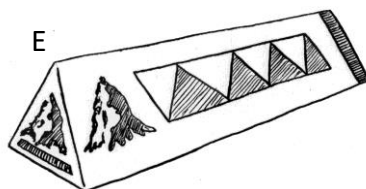
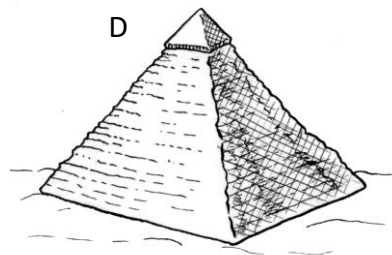
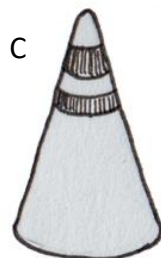
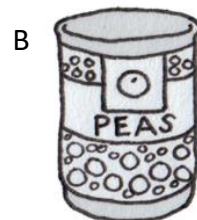
E. ball-shaped

F. box-shaped

c. A : C ; B

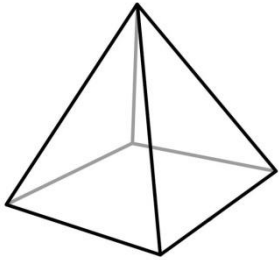
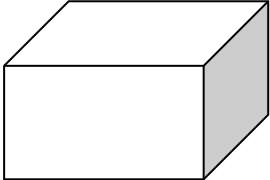
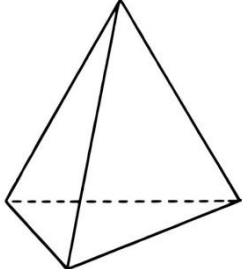
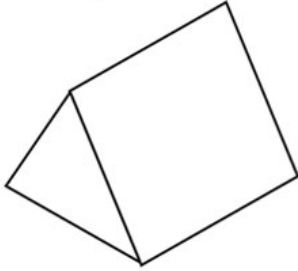
3.2.1(2) a. Name the objects. Choose from these.

sphere	prism	cylinder
pyramid	cone	



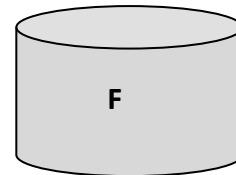
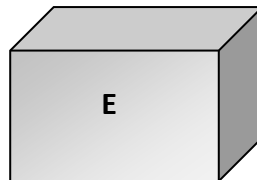
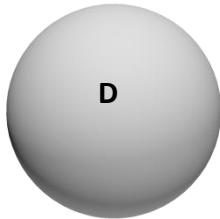
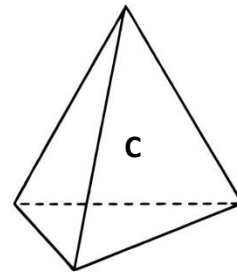
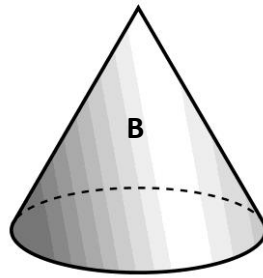
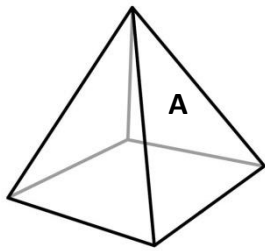
()

b. What shapes do you see in these objects?

	<p><i>Example</i></p> <p><u>Square and triangles</u></p>
	<p>_____</p>
	<p>_____</p>
	<p>_____</p>

()

c.



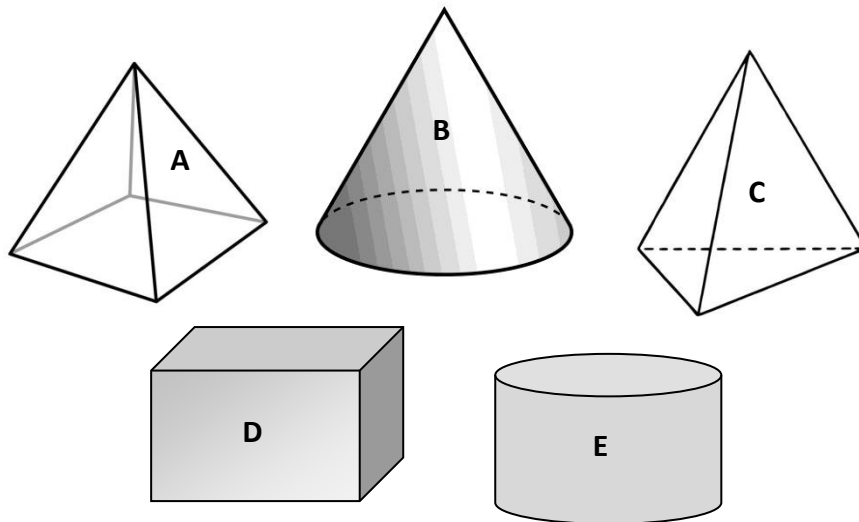
- i) Which objects (A – F) have ONLY flat surfaces?
- ii) Which objects (A – F) have ONLY curved surfaces?
- iii) Which objects (A – F) have flat AND curved surfaces?

()

- Memo:**
- a.

A. sphere	B. cylinder
C. cone	D. pyramid
E. prism	F. prism
 - b. Rectangles ; Triangles ; Triangles and rectangles
 - c.
 - i) A; C ; E
 - ii) D
 - iii) B; F

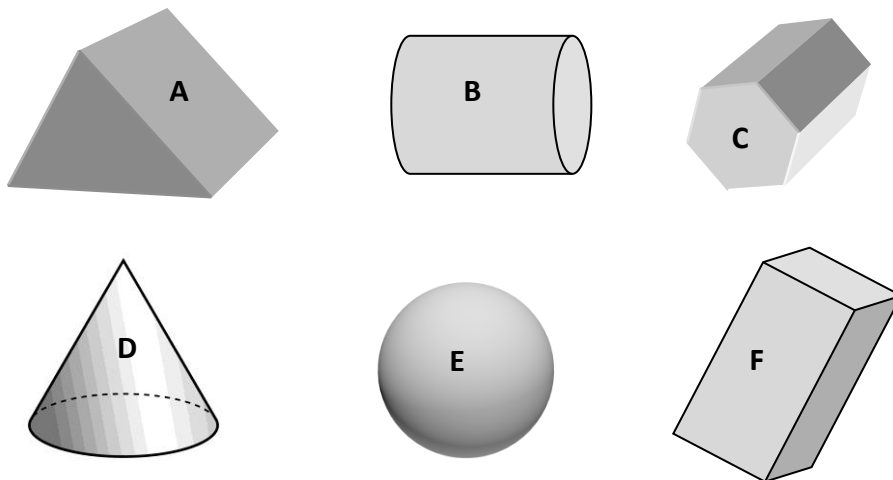
3.2.1(3) a.



- i) Which objects have triangular surfaces?
- ii) Which objects have rectangular surfaces?
- iii) Which objects have circular surfaces?

()

b. Write the letter of the object in the correct column.

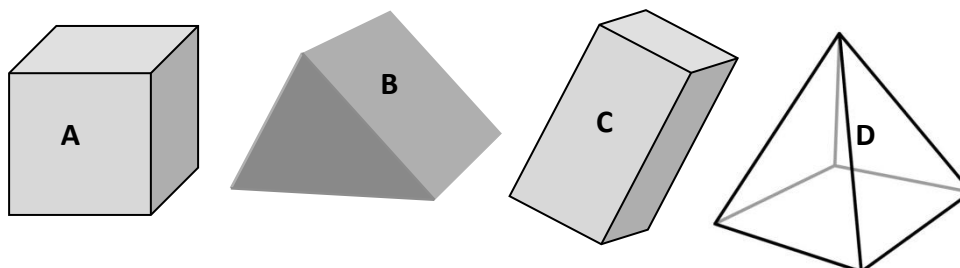


Flat surfaces only	Curved surfaces only	Flat and curved surfaces.

()

- Memo:**
- a.
 - i) A and C
 - ii) A and D
 - iii) B and E
 - b. Flat surfaces only: A, C and F
 - Curved surfaces only: E
 - Flat and curved surfaces: B and D

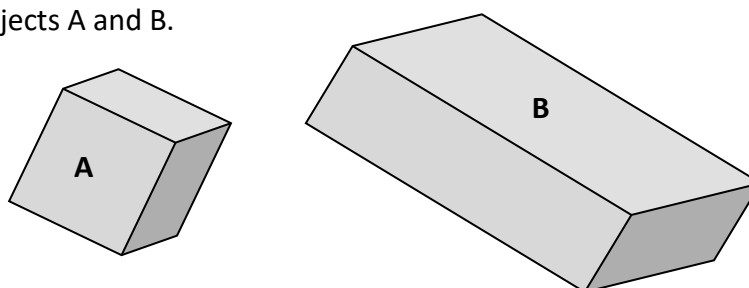
3.2.1(4) a. Complete the table



	Name	Number of faces	Shape(s) of faces
A			Squares
B		5	
C	Rectangular prism		
D			

()

b. Look at objects A and B.



- i) What is the same about A and B?
- ii) What is different about A and B?
- iii) Shape A is a special type of rectangular prism. What is its other name?

()

Memo a. A: Cube, 6 faces, squares

B: Triangular prism, 5 faces, Triangles and rectangles

C: Rectangular prism (or cuboid). 6 faces, Rectangles



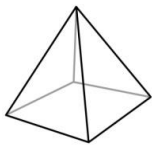

D: Pyramid (or square-based pyramid, 5 faces, square and triangles.

b. i) All surfaces are flat. They both have 6 faces.

ii) The faces in A are all squares, the faces in B are rectangles, but not squares.

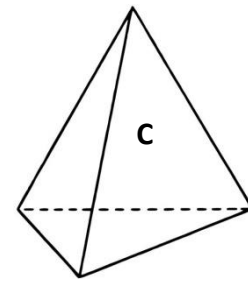
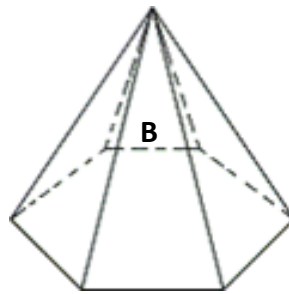
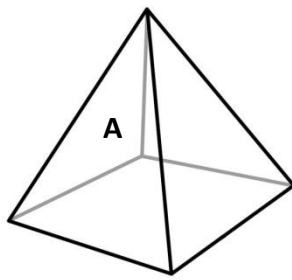
iii) A cube.

3.2.1(5) a. Complete.

	Name	Number of faces	Number of vertices	Number of edges.
				
				
				
				

()

b. Look at the pyramids A, B and C.



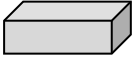

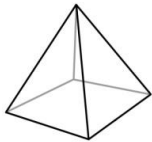

i) What is the same about pyramids A, B and C?

ii) What is different about pyramids A, B and C?

iii) Name pyramid C.

()

Memo: a.

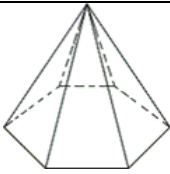

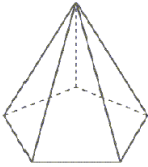

	Name	Number of faces	Number of vertices	Number of edges.
	Rectangular prism (or cuboid)	6	8	12
	Triangular prism	5	6	9
	Square-based pyramid	5	5	8
	Hexagonal prism	8	12	18

b. i) Triangular faces meet at a point (apex).

ii) The base of each pyramid is a different shape.

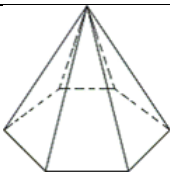

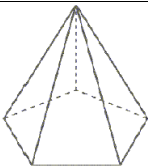

iii) Tetrahedron.

3.2.1(6) Complete.

	Name	Number of faces	Number of vertices	Number of edges.
				
				
				
				

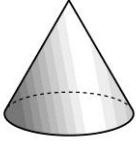
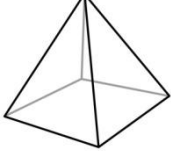
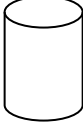
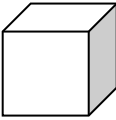
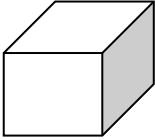
()

Memo

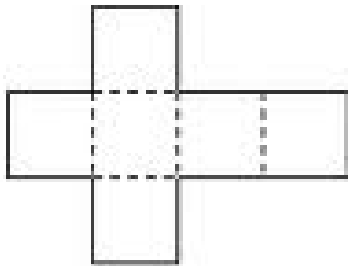
	Name	Number of faces	Number of vertices	Number of edges.
	Hexagonal pyramid	7	7	12
	Hexagonal prism	8	12	18
	Pentagonal pyramid	6	6	10
	Pentagonal prism	7	10	15

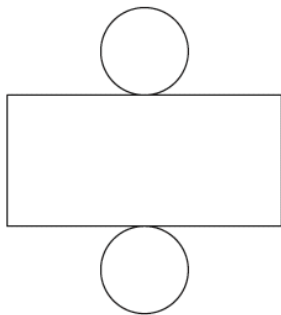
3.2.2 Further activities

3.2.2(4)

				
Cone	Pyramid	Cylinder	Cube	Rectangular prism

What objects do these nets make? Choose from the list above.





()

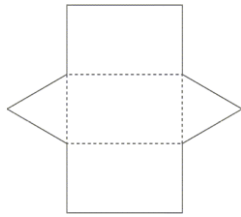
Memo Cube and cylinder

3.2.2(5) a.

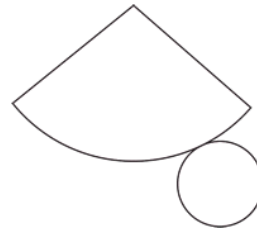
Triangular prism	Tetrahedron	Sphere	Rectangular prism
Cone	Square-based pyramid	Cylinder	Cube

What objects do these nets make? Choose from the list above.

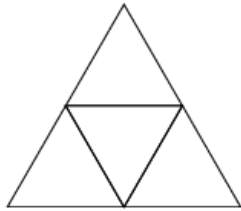
i)



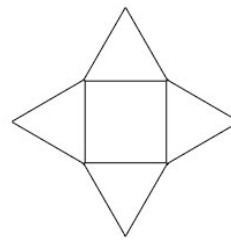
ii)



iii)

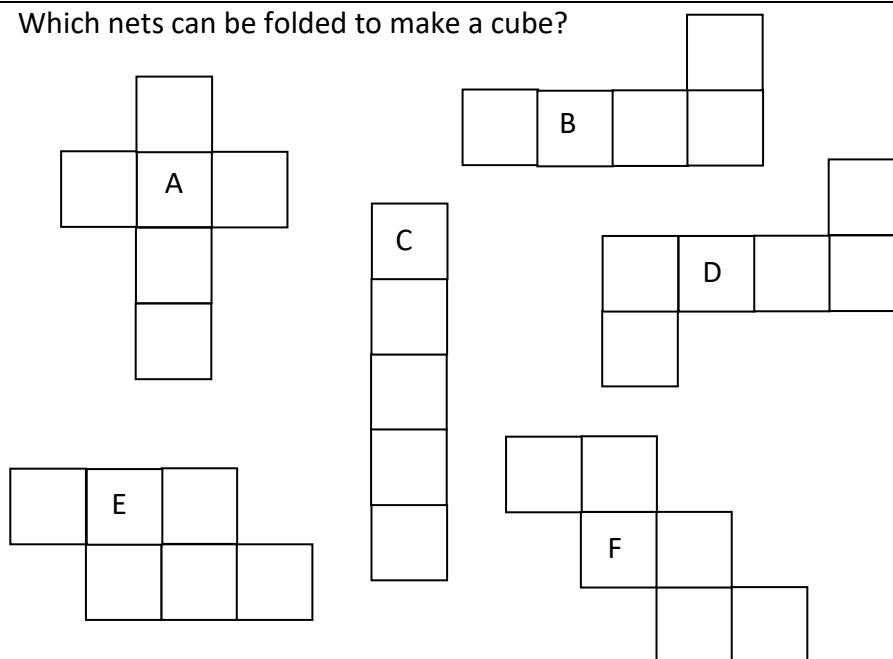


iv)



()

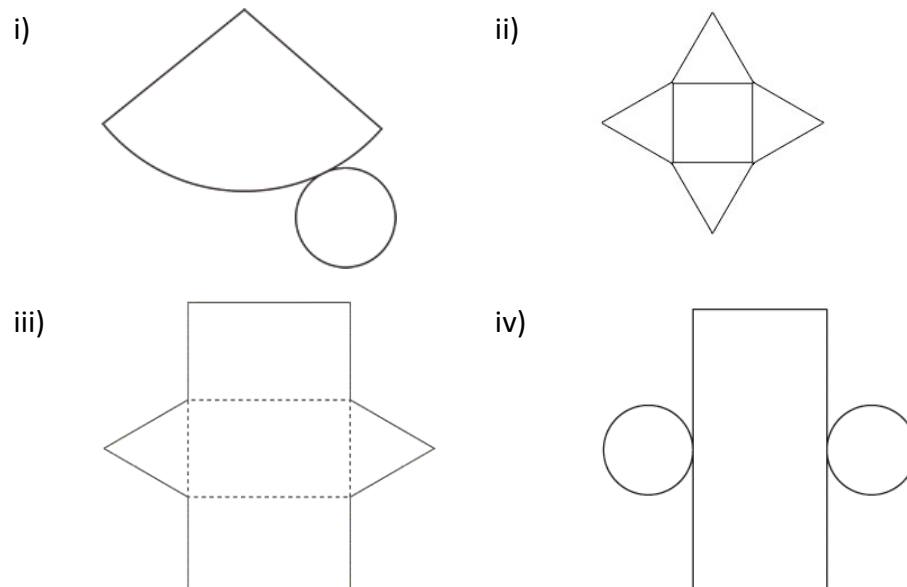
b. Which nets can be folded to make a cube?



()

- Memo**
- a. i) Triangular prism ii) Cylinder
- iii) Tetrahedron (or triangular pyramid) iv) Square-based pyramid
- b. A ; D and F

3.2.2(6) What 3-D shapes can you make using these nets?



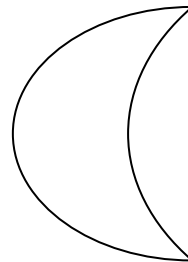
()

- Memo**
- a. i) cone ii) Square-based pyramid
- iii) Triangular prism iv) cylinder

3.3 Symmetry

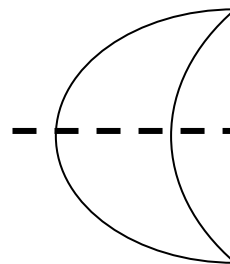
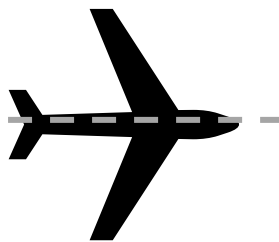
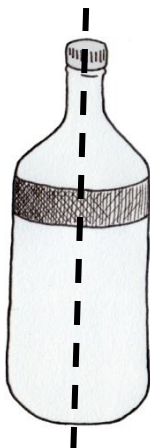
3.3.1 Symmetry

3.3.1(1) Draw in a line of symmetry on each of the pictures below.



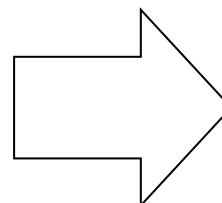
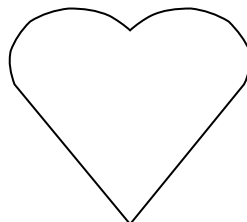
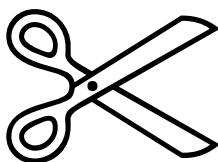
()

Memo



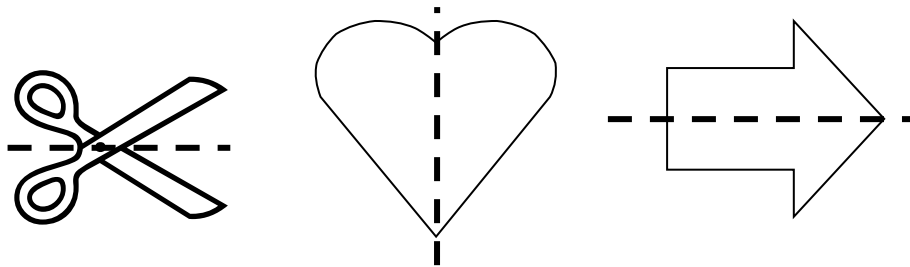
Ensure that the line cuts these shapes in to two pieces that are the same size.

3.3.1(2) Draw in the line of symmetry.



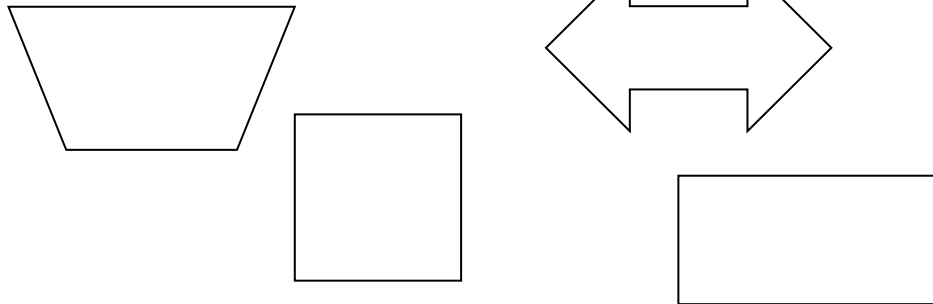
()

Memo:



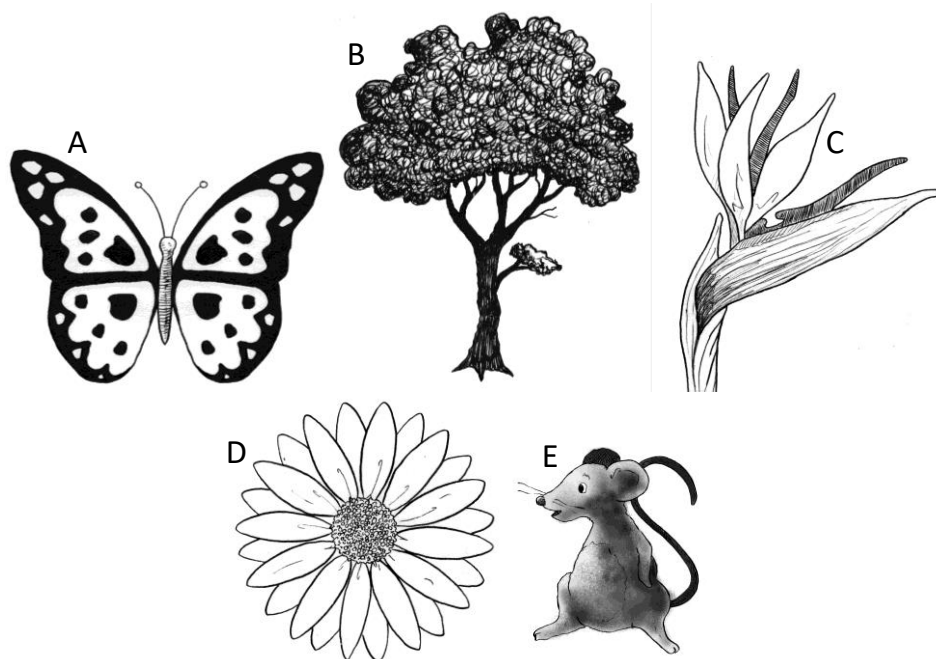
Ensure that the line cuts these shapes in to two pieces that are the same size.

3.3.1(3) a. Draw in the line or lines of symmetry.



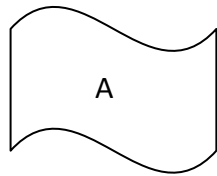
()

b. Which of these objects do NOT have line symmetry?

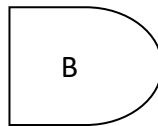


()

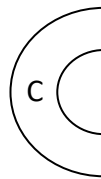
c. Which of these shapes have line symmetry?



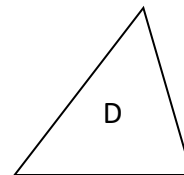
A



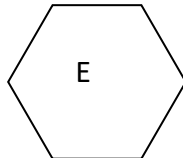
B



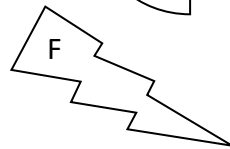
C



D



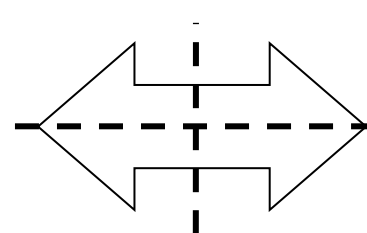
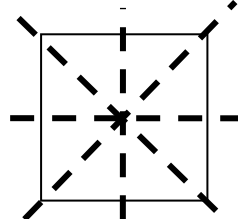
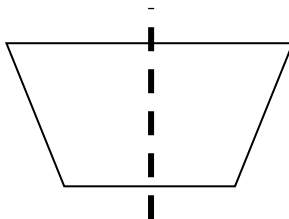
E



F

()

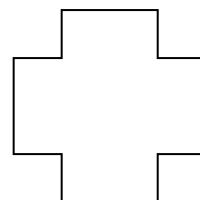
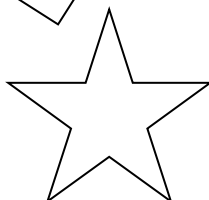
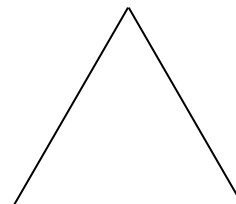
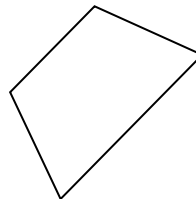
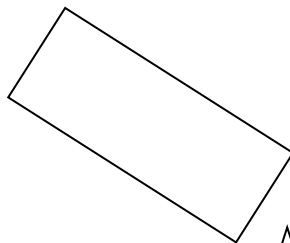
Memo: a.



b. B ; C and E

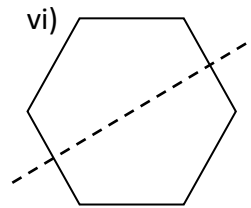
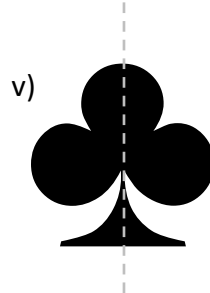
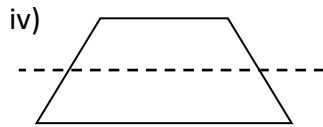
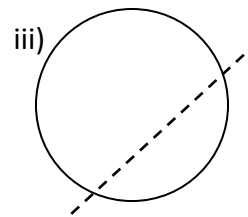
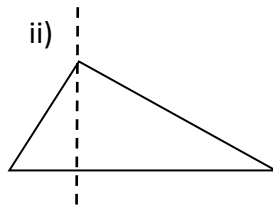
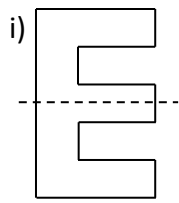
c. B ; C and E

3.3.1(4) a. Draw in the line or lines of symmetry.



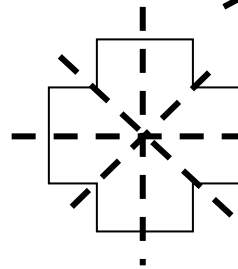
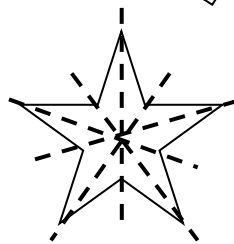
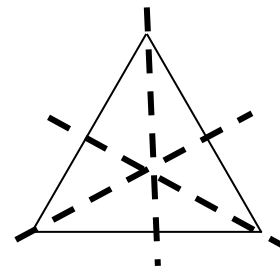
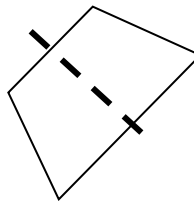
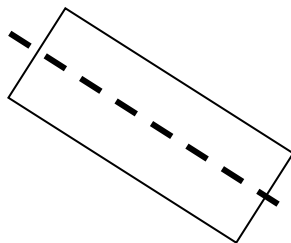
()

b. State whether or not the dotted lines drawn on these shapes are lines of symmetry. Write 'yes' or 'no'.



()

Memo: a.



b. i) Yes

ii) No

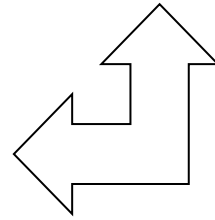
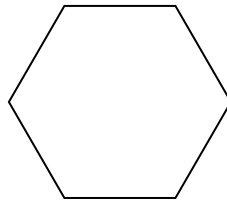
iii) No

iv) No

v) Yes

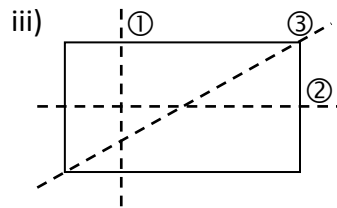
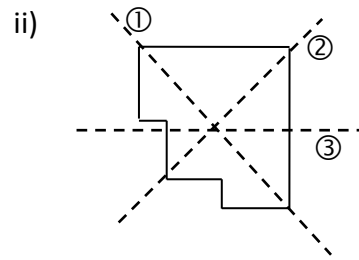
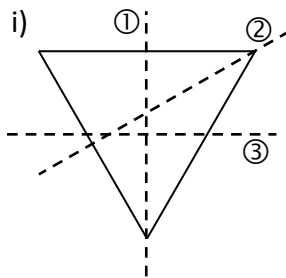
vi) Yes

3.3.1(5) a. Draw in the line or lines of symmetry.



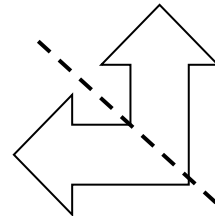
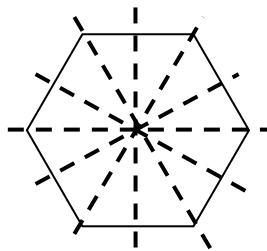
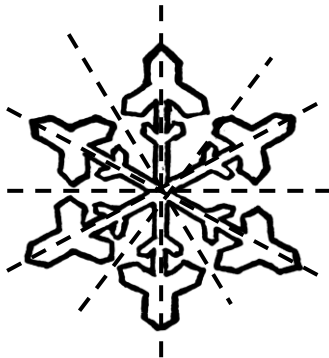
()

b. Three dotted lines (①; ② and ③) have been drawn on shapes i) to iii). Write down all of the dotted lines which are lines of symmetry.



()

Memo: a.



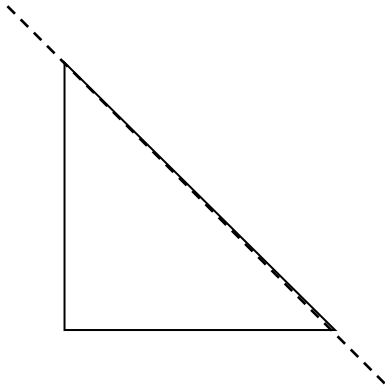
b. i) 1 and 2

ii) 2

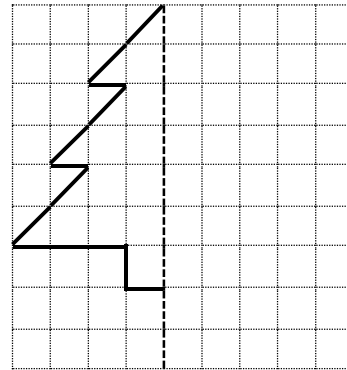
iii) 2

3.3.1(6) Draw the second half of each shape so that it is symmetrical about the dotted line.

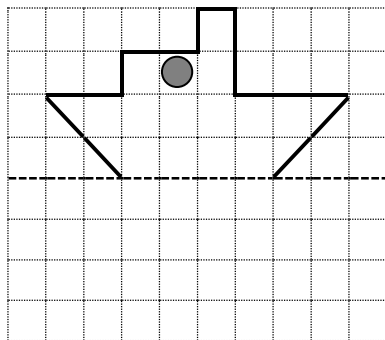
i)



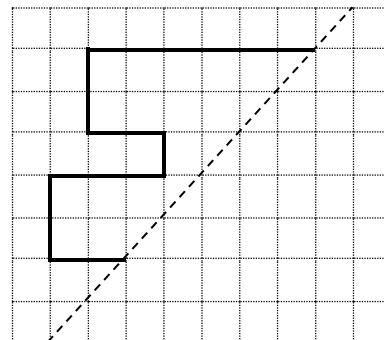
ii)



iii)

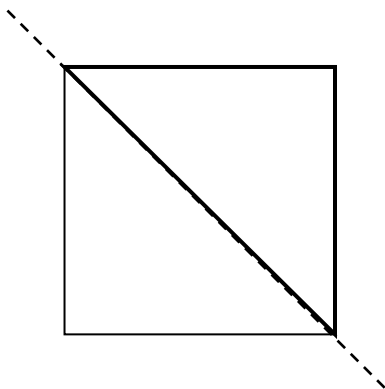


iv)

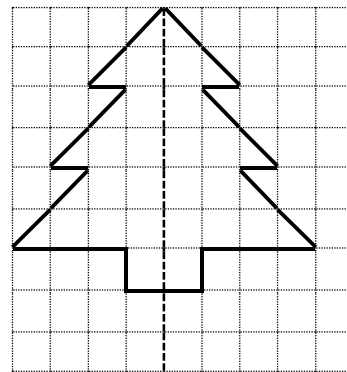


()

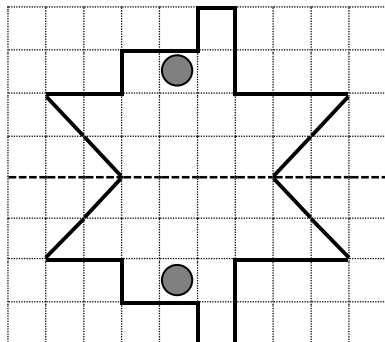
Memo: i)



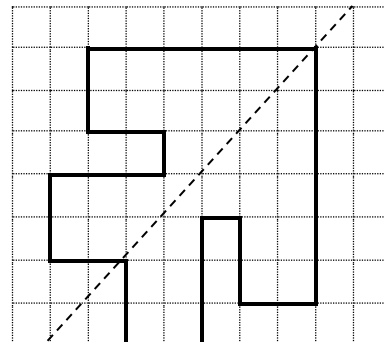
ii)



iii)



iv)

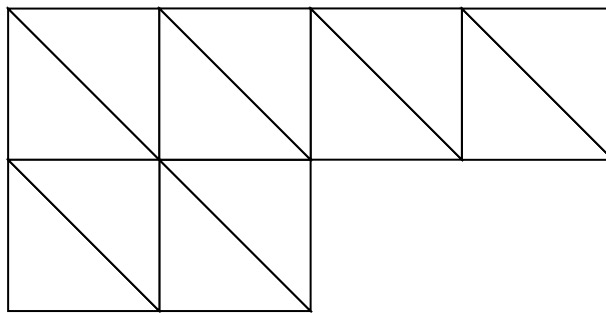


3.4 Transformations

3.4.1 Build composite shapes – Assessed practically

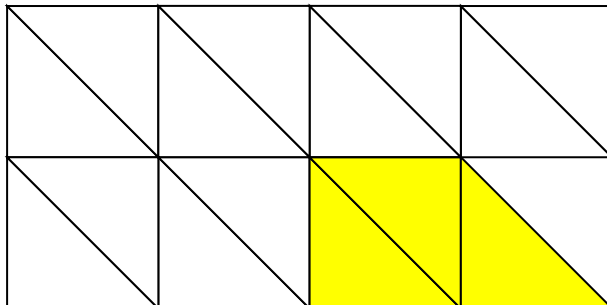
3.4.2 Tessellations – Assessed practically

3.4.2(3) Add three more triangles to the picture to continue the pattern.



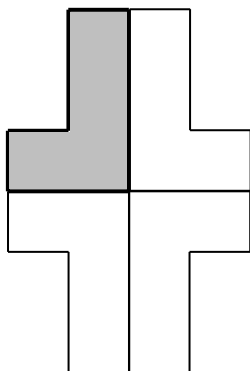
()

Memo: Learners may add *THREE* or more triangles anywhere on this picture so that there are no spaces between the triangles. For example:

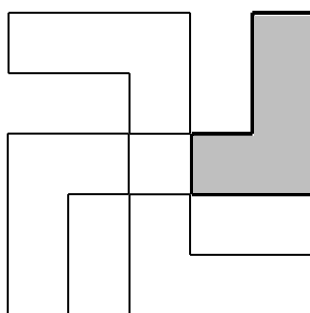


3.4.2(4) a. Look at the patterns below. Say whether the dark shape has made slides, flips or turns.

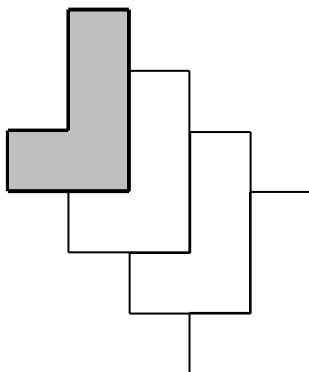
i)



ii)

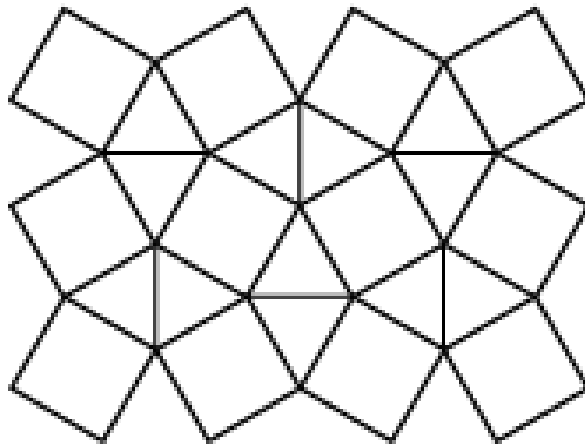


iii)



()

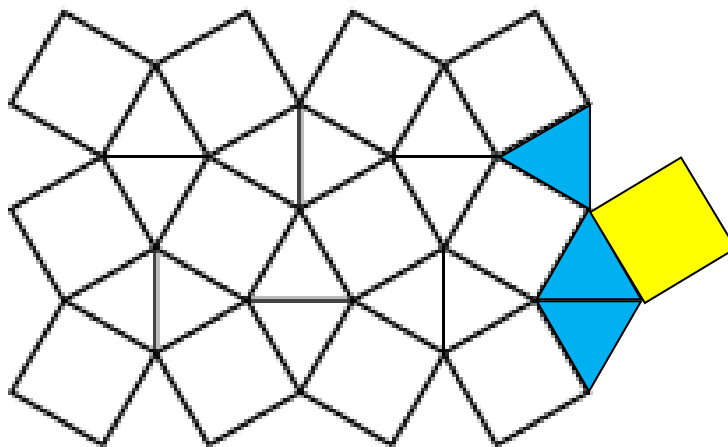
- b. Add three more shapes to the picture to continue the pattern.



()

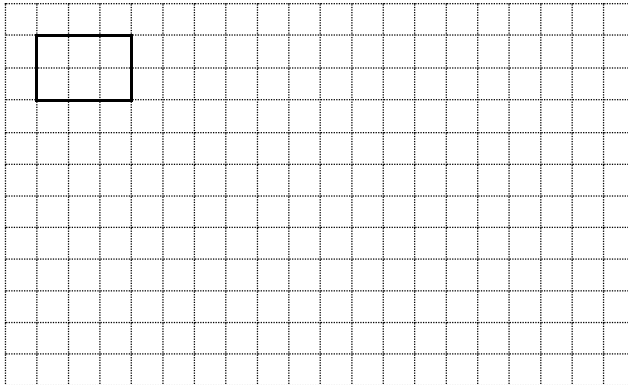
- Memo:** a. i) flip ii) turn
iii) slide

- b. *Learners may add THREE or more squares and/or equilateral triangles anywhere on this picture so that there are no spaces between these shapes. For example:*



3.4.3 Enlargements and reductions

3.4.3(5) a. Draw an enlargement of this rectangle by a scale factor of 3.



()

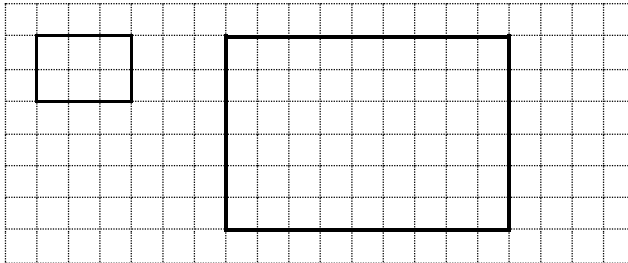
b. A triangle has sides 4 cm, 6 cm and 7 cm long.

i) What will the lengths of a new triangle be if this triangle is enlarged by a scale factor of 5?

ii) What factor would this triangle be enlarged by if the length of the new sides are 2 cm, 3 cm and 3,5 cm?

()

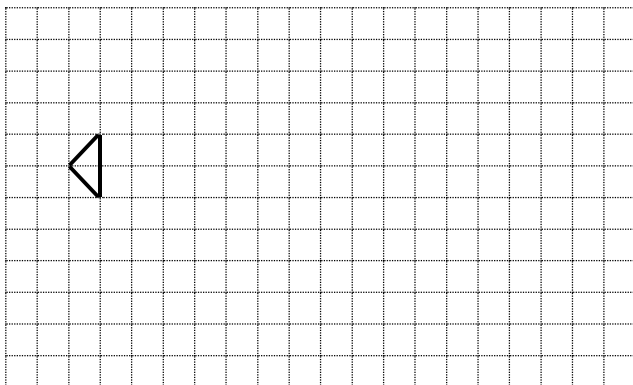
Memo: a.



b. i) 20 cm; 30 cm and 35 cm

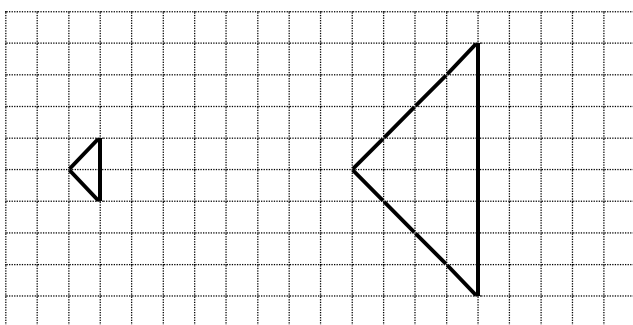
ii) 0,5 or $\frac{1}{2}$

3.4.3(6) Draw an enlargement of this triangle by a scale factor of 4.



()

Memo:



3.5 Viewing of Objects

3.5.1 Positions and views

3.5.1(1) a. Choose the correct one.

on top	in front	behind	left
right	under	up	down



The tree is _____ the dog house.

The ball is _____ of the dog house.

The dog is sleeping _____ of the dog house.

The mouse is sitting _____ of the sleeping dog.

()

b. Match the side views of these animals with the front views.

i)



ii)



iii)



iv)



v)



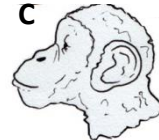
A



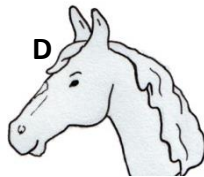
B



C



D



E



()

Memo: a. The tree is **behind** the dog house.

The ball is **left** of the dog house.

The dog is sleeping **in front** of the dog house.

The mouse is sitting **on top** of the sleeping dog.

b. i) B

ii) E

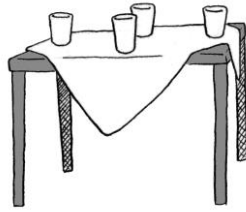
iii) A

iv) C

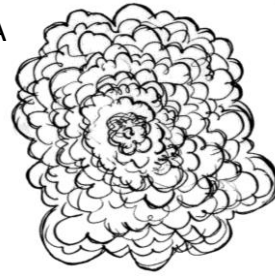
v) D

3.5.1(2) a. Match the side view with the top view.

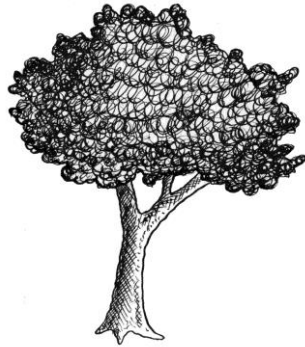
i)



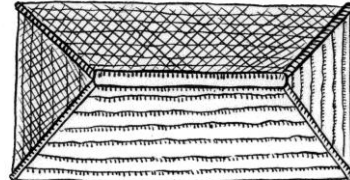
A



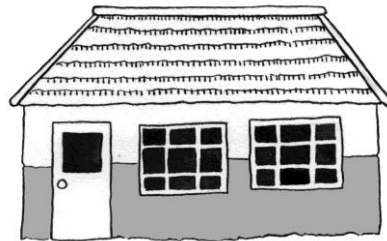
ii)



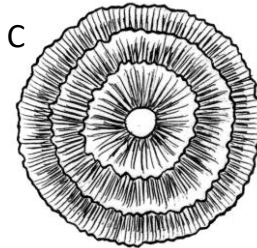
B



iii)



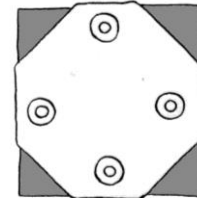
C



iv)

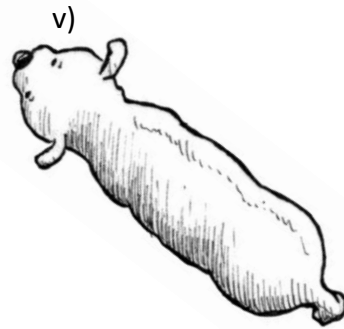
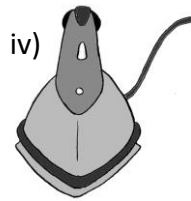
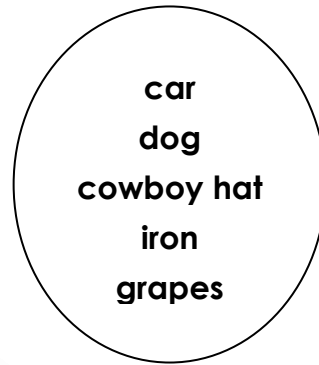
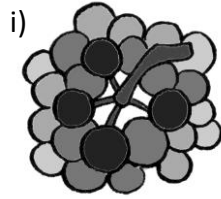
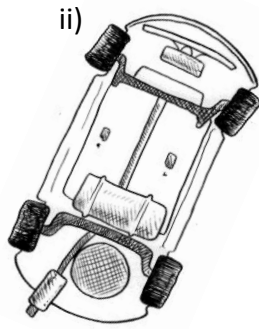


D



()

b. Name these objects.



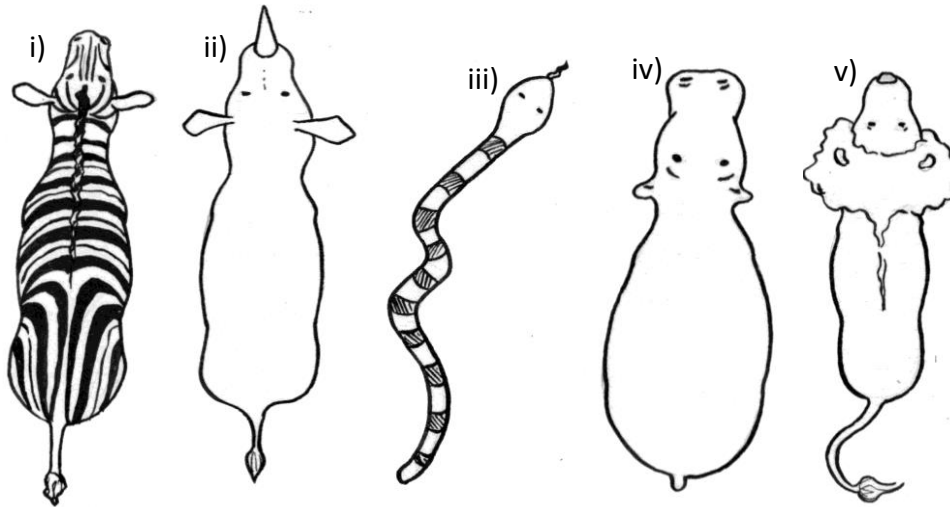
()

Memo:

a.	i)	D	ii)	A
	iii)	B	iv)	C
b.	i)	grapes	ii)	car
	iii)	cowboy hat	iv)	iron
	v)	dog		

3.5.1(3) a. Name these animals.

snake	zebra	rhino	hippo
lion	giraffe	kudu	cheetah



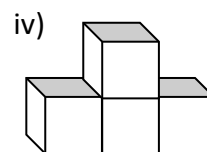
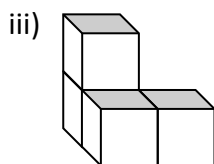
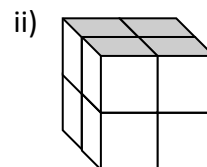
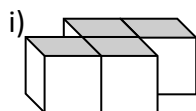
()

b. Draw rough sketches of what a **bicycle** would look like from:

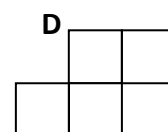
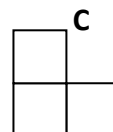
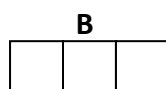
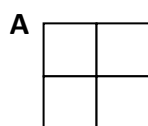
- i) the top
- ii) the front
- iii) the side

()

c. Match these side views with top views A – D.



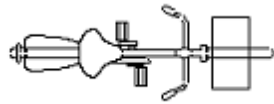
Top views:



()

- Memo:**
- a. i) zebra
 - ii) rhino
 - iii) snake
 - iv) hippo
 - v) lion

- b. i) *Sketches do not have to be detailed artwork. These are examples only.*



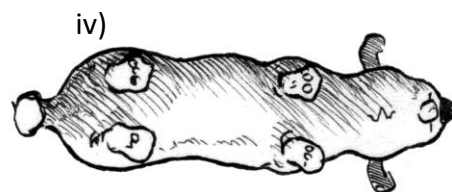
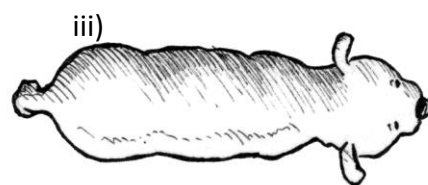
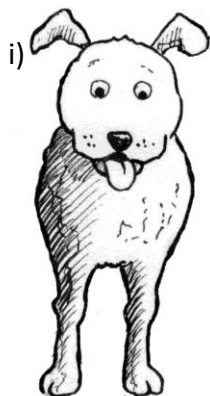
iii)



- c. i) D
- ii) A
- iii) C
- iv) B

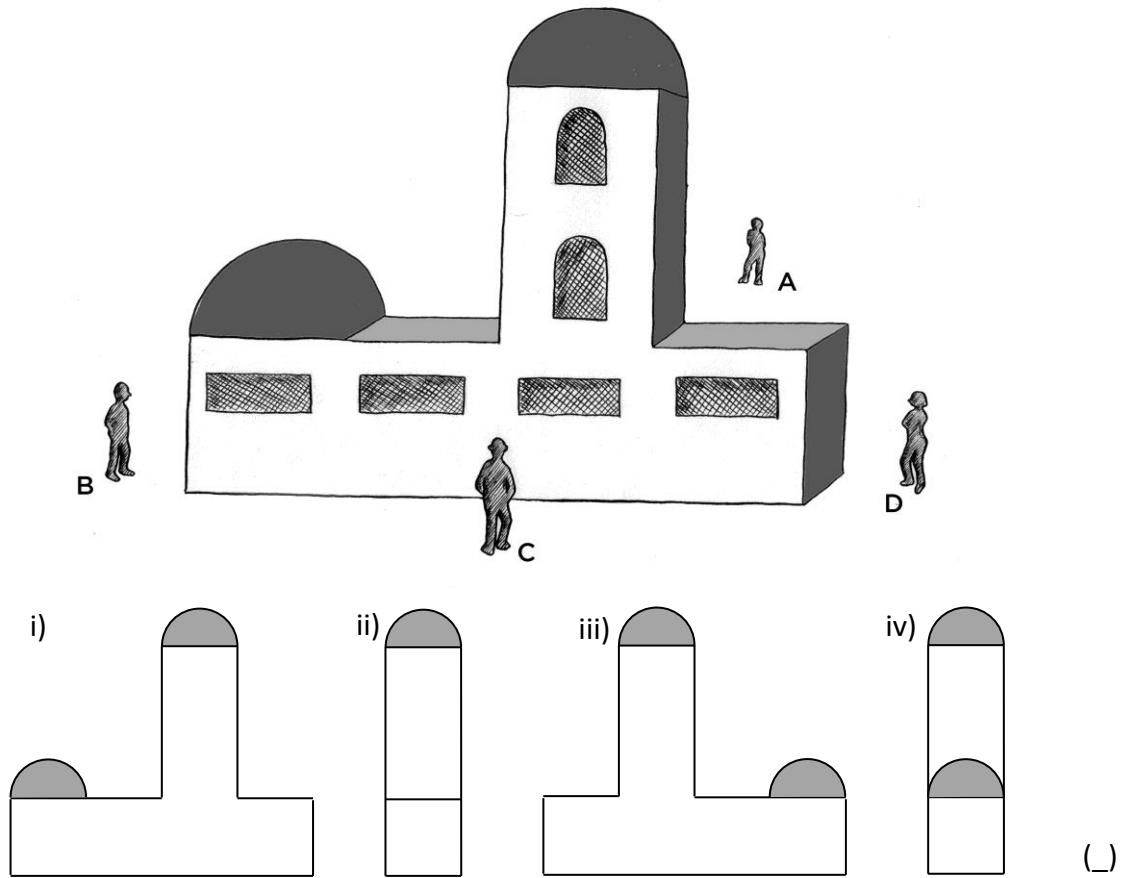
- 3.5.1(4) a. Here are four different views of the same dog. From which position is each drawn?

top	front	side	bottom	back
-----	-------	------	--------	------



()

- b. Four people are standing on different sides of a building. Match view i), ii), iii) and iv) with the person seeing that view (A – D)



Memo: a. i) front

ii) back

iii) top

iv) bottom

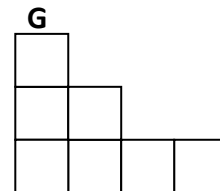
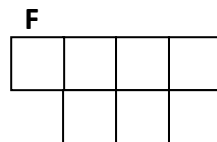
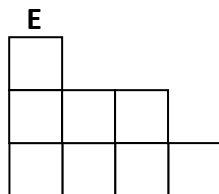
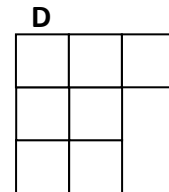
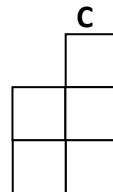
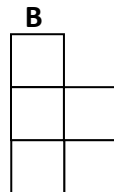
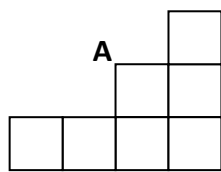
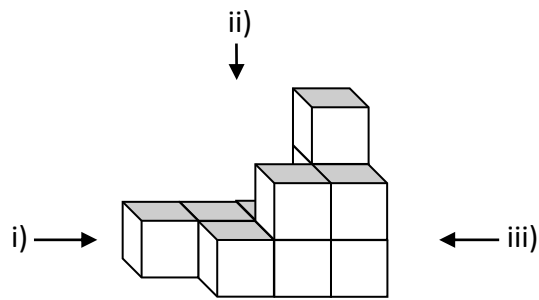
b. i) C

ii) D

iii) A

iv) B

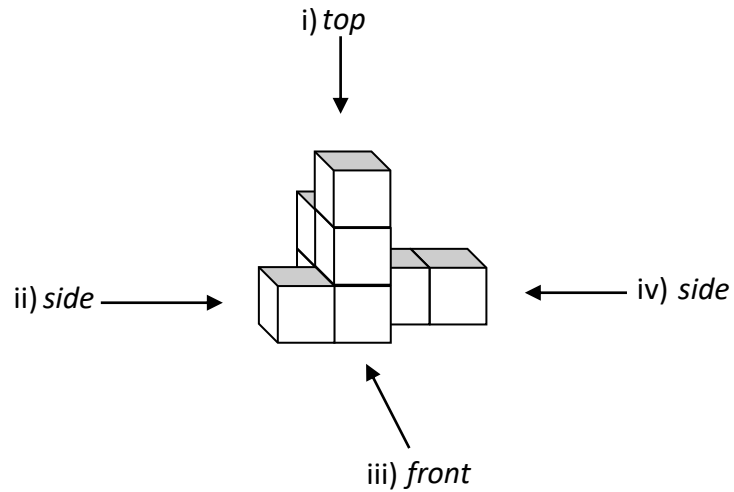
3.5.1(5) Match views i), ii) and iii) with the correct image (A – G).



()

Memo: i) B ; ii) F ; iii) C

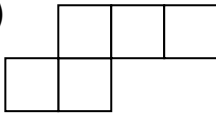
3.5.1(6) Draw the image that will be seen from view i), ii), iii) and iv).



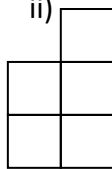
()

Memo:

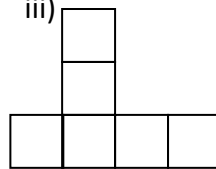
i)



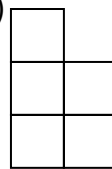
ii)



iii)



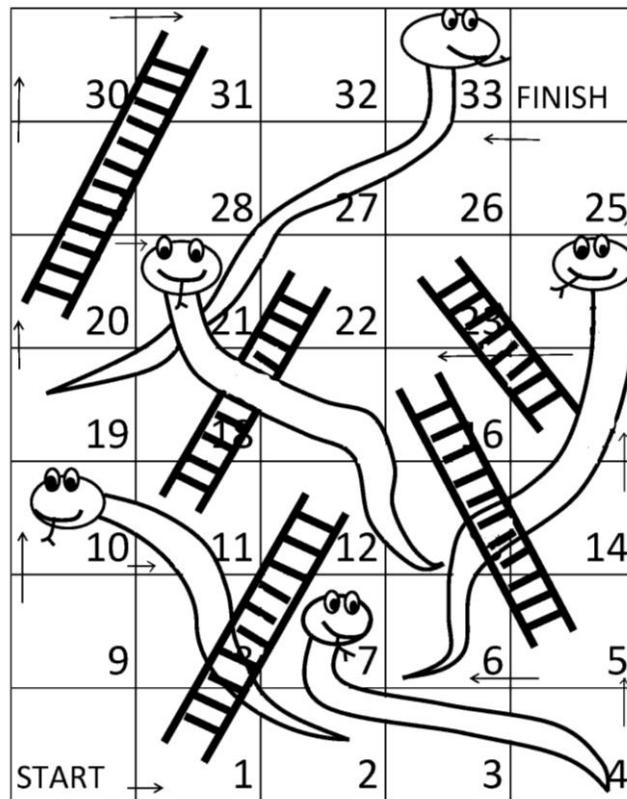
iv)



3.6 Position and Movement

3.6.1 Location and directions

3.6.1(2) The picture below is a board for the game *Snakes and Ladders*.



- How many blocks are on the board?
- Describe where you would find the start block.
- Give the numbers of all the blocks that have a snake's head.
- If your marker is on Block 6 and you throw a 4 on the die, which block will your counter move to?
- When a counter stops at the bottom of the ladder, it can move up the ladder. If your counter is on Block 17 and you throw a 3 on the die, which block will your counter move to?
- If your counter is on Block 29, how much should you throw on the die to be able to move your counter to the Finish Block?

()

Memo: c. 35 blocks

d. Bottom, left hand corner.





e. 7; 10; 21; 24 and 33

f. Block 10

g. Block 31

h. 5

3.6.1(3) On the grid below, the position of the star (★) can be described as E5.

	1	2	3	4	5	6
A						
B						
C						
D						
E					★	
F						

Describe the position of the following:

a. Candle (🕯)

b. Scissors (✂)

c. Pencil (✎)

d. Bell (🔔)

()

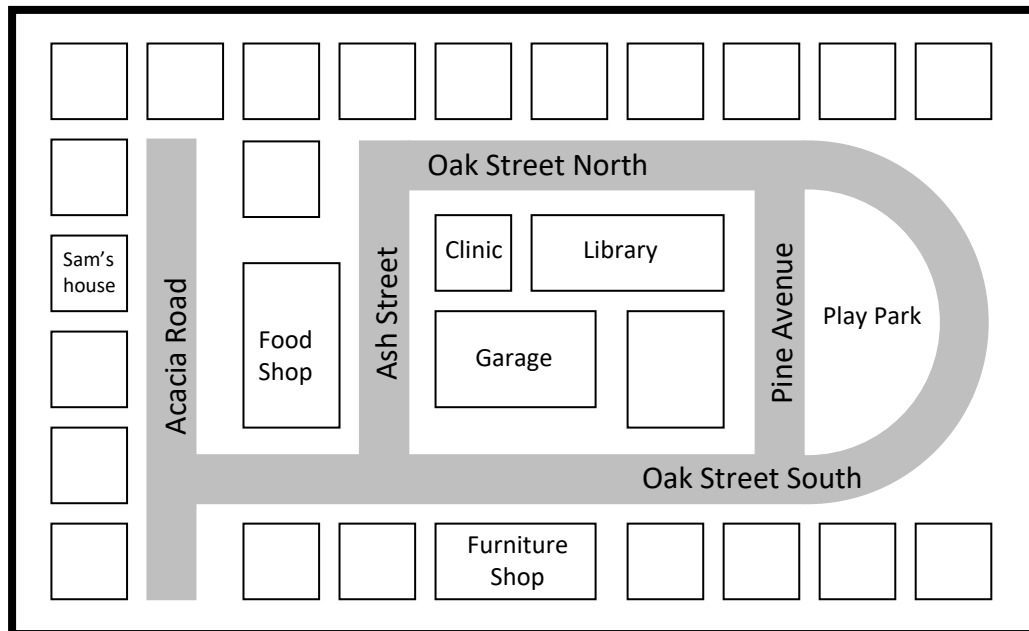
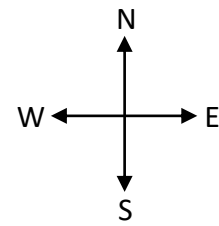
Memo: a. C6

b. D5

c. F1

d. B2

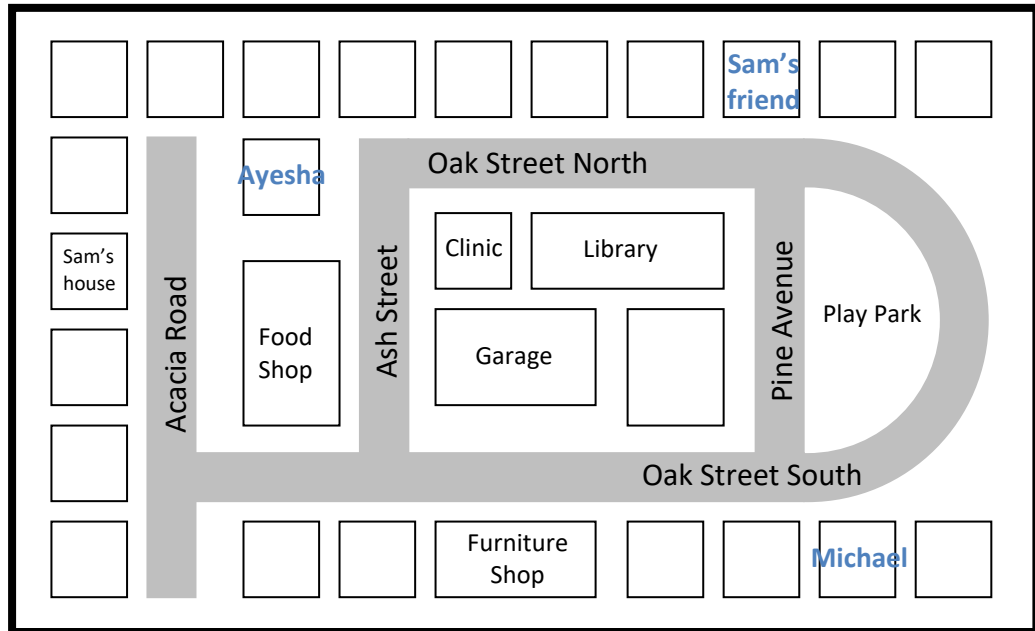
3.6.1(4)



()

- a. Sam walks to his friend's house. He turns right into Acacia Road and left into Oak Street South. He turns left into Pine Street and walks to the end of the Pine Street. His friend's house is in front of him. Mark Sam's friends house on your map. ()
- b. Describe TWO ways that Sam could walk to the Library. ()
- c. Use the information below to find these people's houses on your map. Write their names on their houses. ()
 - i) Ayesha lives one house North of the Food Shop. ()
 - ii) Michael lives three houses east of the Furniture Shop. ()

Memo: a.

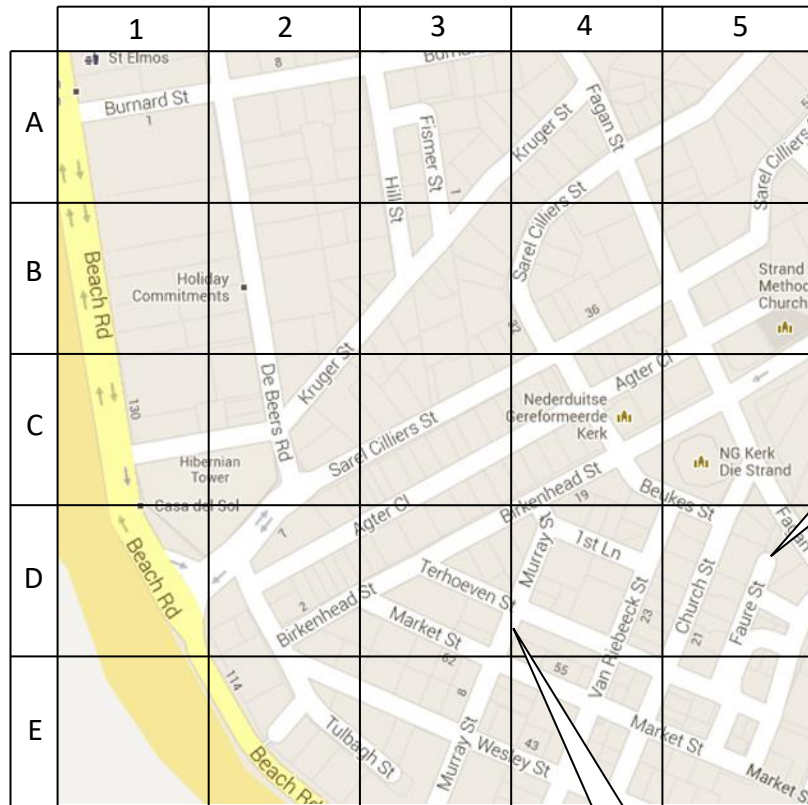


- b. He could turn right into Acacia Road, left into Oak Street South, left into Ash Street and then right into Oak Street North. The library will be on his right.

OR, he could turn right into Acacia Road, left into Oak Street South, left into Pine Avenue and then right into Oak Street North. The library will be on his right.

- c. *Answers are given in map above.*

3.6.1(5)



Ref: Google Maps

- a. In which block would you find the Nederduitse Gereformede Church (Kerk)? ()
- b. Firdous lives at the end of Faure Street and her friend Sara lives in Murray Street. Firdous walks to Sara's house and then they walk to the beach. Describe the shortest route that Firdous will take. ()

Memo: a. C4

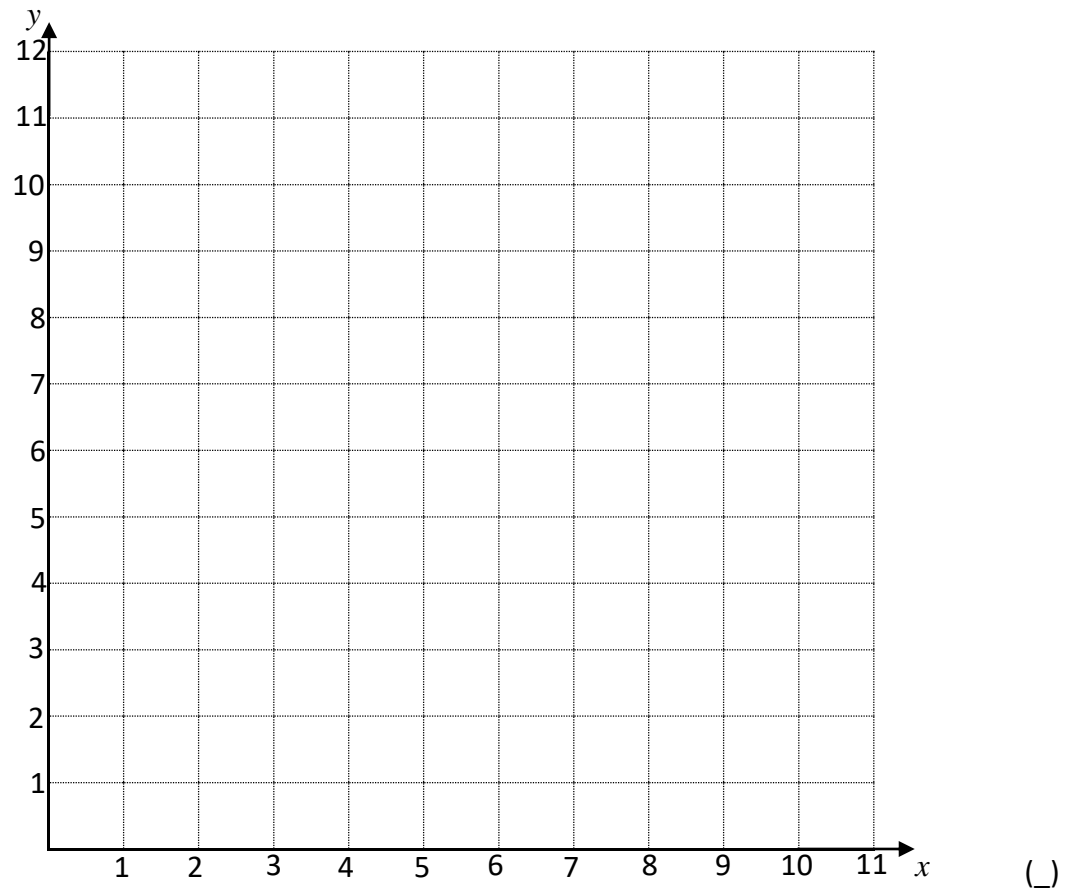
- b. Firdous walks down Faure Street and turns right into Terhoeven Street. She turns left into Murray Street to get Sara. They then continue down Murray Street until they turn right into Wesley Street. They walk along Wesley Street until they get to Sarel Cilliers Street. They turn left and the beach will be in front of them.

3.6.1(6)

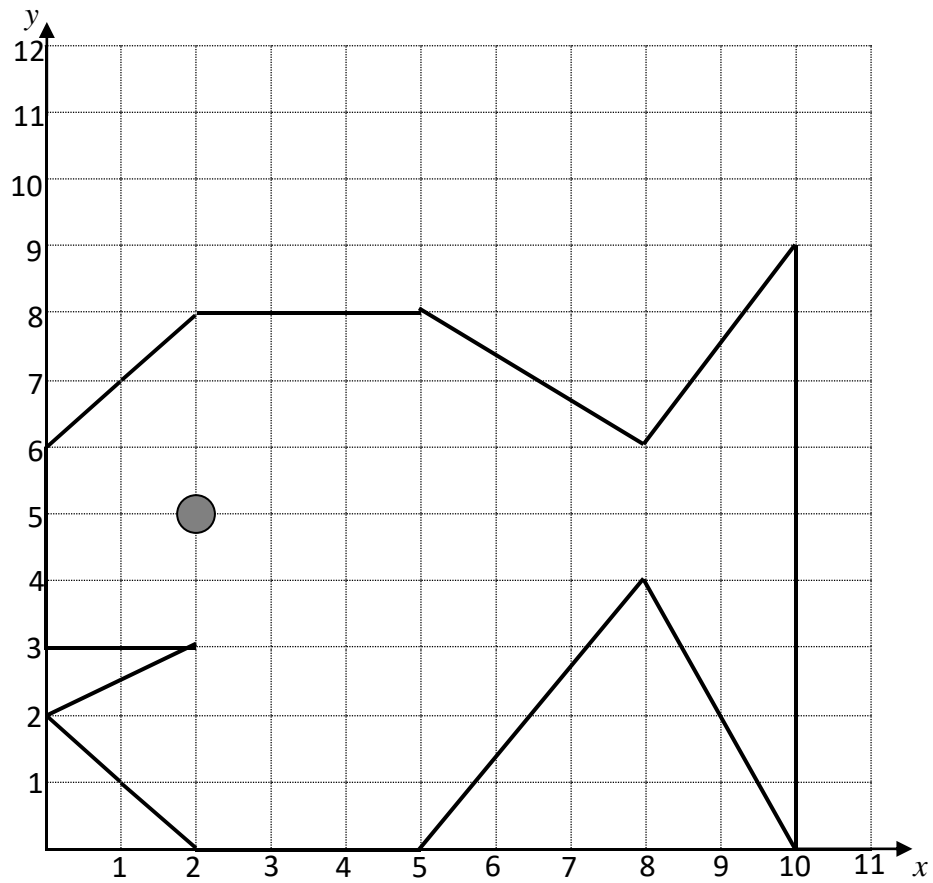
Plot the following points on this Cartesian Plane and join them in the same order.

$(0 ; 2) ; (2 ; 3) ; (0 ; 3) ; (0 ; 6) ; (2 ; 8) ; (5 ; 8) ; (8 ; 6) ; (10 ; 9) ; (10 ; 9) ;$
 $(10 ; 0) ; (8 ; 4) ; (5 ; 0) ; (2 ; 0) ; (0 ; 2)$

Draw a dot at $(2 ; 5)$. What image do you see?



Memo:



4 MEASUREMENT

4.1 Length

4.1.1 Practical measuring - PRACTICAL

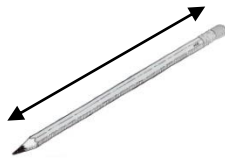
4.1.2 Measuring instruments

4.1.3 Units

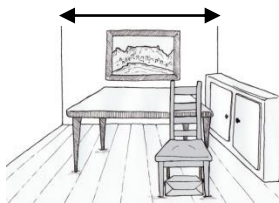
4.1.2(1) a. Circle the objects that you would measure with a metre stick.

4.1.3(1)

Length of a pencil



Length of room wall



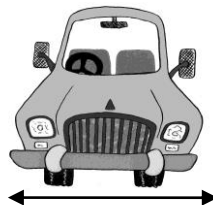
Height of a chair



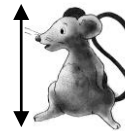
Your friend's height



Width of a car



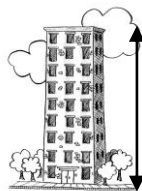
Height of a mouse



Height of a mug



Height of a tall building



Height of a small tree



()

b. Choose what unit of measurement would you use to measure:

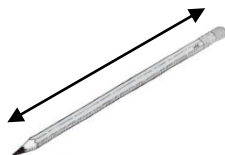
metre	millimetre	centimetre	kilometre
-------	------------	------------	-----------

Pencil	
Length of classroom wall	
Your friend's height	
The distance a car travels	
The height of a cat	
The width of a sharpener	

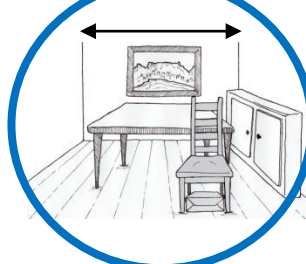
()

Memo a.

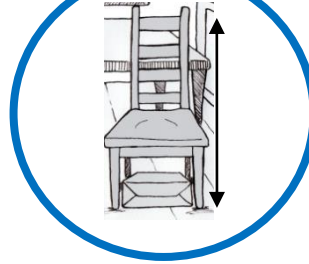
Length of a pencil



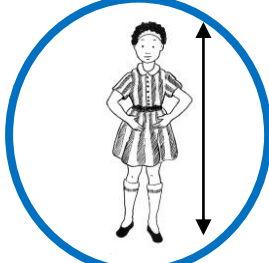
Length of room wall



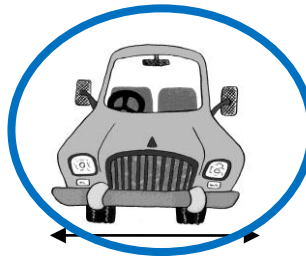
Height of a chair



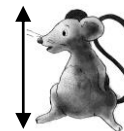
Your friend's height



Width of a car



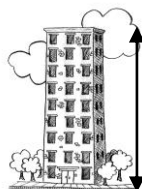
Height of a mouse



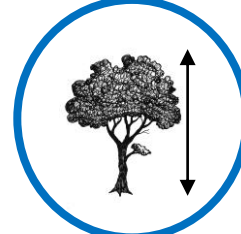
Height of a mug



Height of a tall building



Height of a small tree



b. Pencil: **mm** or **cm**

Length of classroom wall: **m**

Your friend's height: **m**

The distance a car travels: **km**

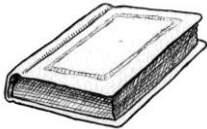




The height of a cat: **cm**

The width of a sharpener: **mm**

4.1.2(2) a. What would you use to measure?

4.1.3(2)

A Metre stick	A Ruler
---------------	---------

Width of a textbook		
Height of a wall picture		
Length of a bed		
The length of an iron		
Height of a small tree		

()

- b. Estimate and measure.

	<u>Estimate</u>	<u>Measurement</u>
Cold drink bottle		
A friend's height		
Height of cupboard		
Width of a window in your classroom		

Write these measurements in order from smallest to largest.

()

Memo a. Width of textbook: **ruler**

Height of a wall picture: **metre stick**

Length of a bed: **metre stick**

The length of an iron: **ruler**

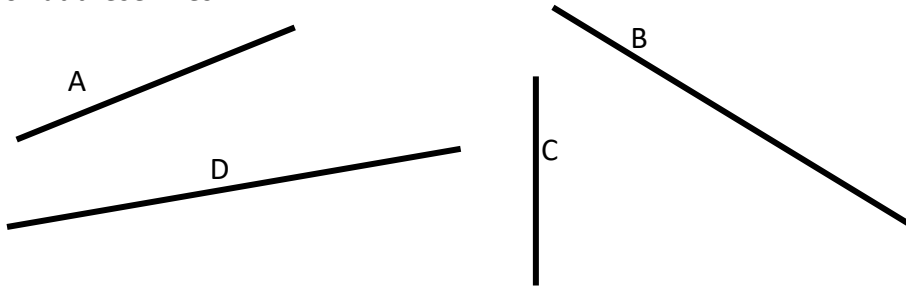
Height of a small tree: **metre stick**

- b. *The answers to these measurements will differ.*

Order: **Cold drink bottle, width of a window in your classroom, a friend's height; height of a cupboard**

4.1.2(3) a. Look at these lines

4.1.3(3)



Complete:

<u>Line</u>	<u>Estimate length</u>	<u>Actual length</u>
A	_____ mm	_____ mm
B	_____ mm	_____ mm
C	_____ mm	_____ mm
D	_____ mm	_____ mm

Write the lengths in order from shortest to longest.

()

b. Underline the correct one

I use [centimetres; metres; kilometres] to measure the distance from my classroom to the toilets.

I use [centimetres; metres] to measure the length of my arm.

I use [centimetres; metres; kilometres] to measure the distance from Johannesburg to Durban.

I use [millimetres; centimetres; metres] to measure the length of my eraser.

()

Memo a. Actual lengths: *Accept 2 mm difference each side.*

A: 40 mm ; B: 55 mm ; C: 17 mm ; D: 60 mm

Order: 17 mm ; 40 mm ; 55 mm ; 60 mm

b. metres, centimetres, kilometres, millimetres

4.1.2(4) a. What would you use to measure?

4.1.3(4)

Measuring tape	Ruler	Trundle wheel	Metre stick
----------------	-------	---------------	-------------

Length of a rugby field _____

Length of material to make a dress _____

Length of your foot _____

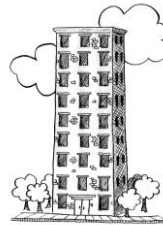
()

b. Choose the correct one:

Metre	Millimetre	Centimetre	Kilometre
-------	------------	------------	-----------



5 _____



20 _____



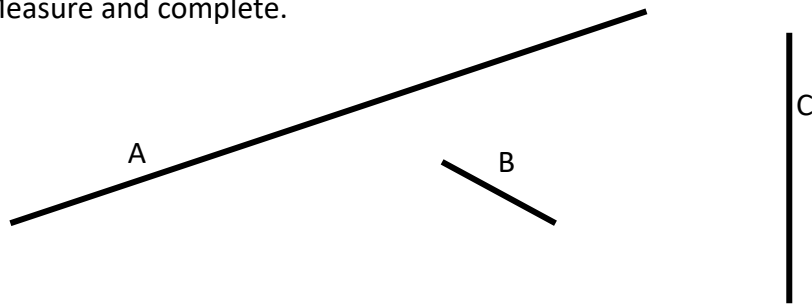
10 _____



18 _____

()

c. Measure and complete.



	<u>Centimetres</u>	<u>Millimetres</u>
A		
B		
C		

()

Memo: a. Length of a rugby field: **trundle wheel**

Length of material to make a dress: **measuring tape**

Length of your foot: **ruler or measuring tape**

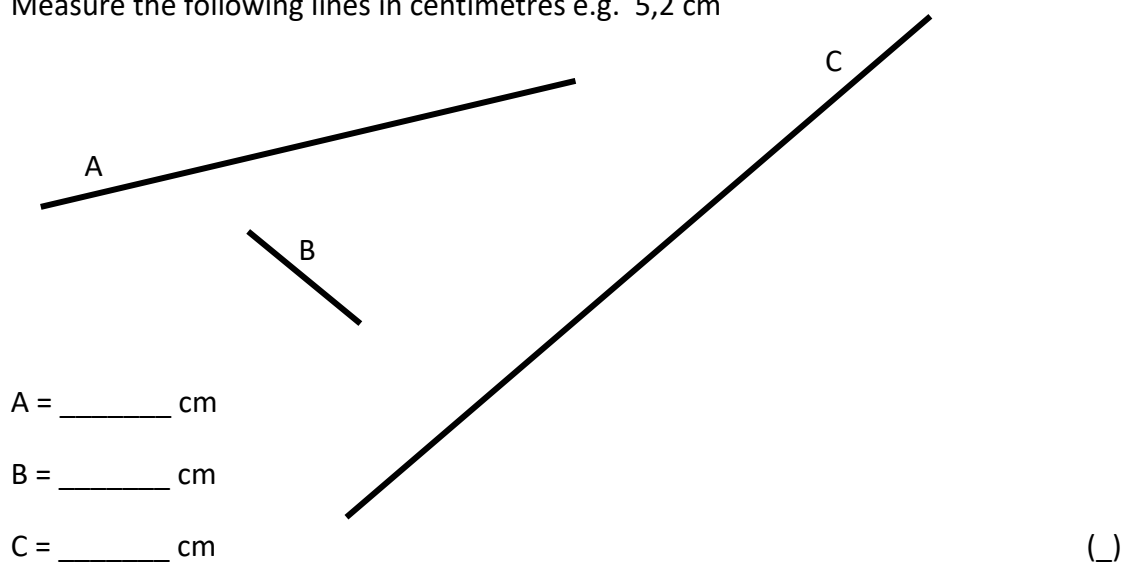
b. 5 **metres** ; 20 **metres** ; 10 **centimetres**, 18 **millimetres**

c.

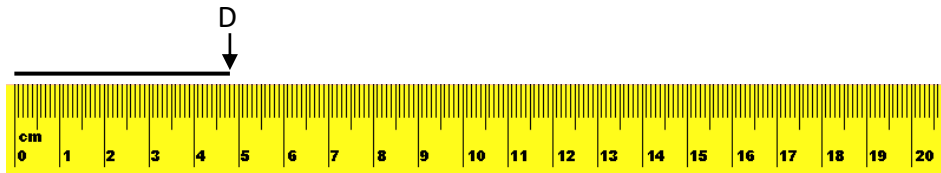
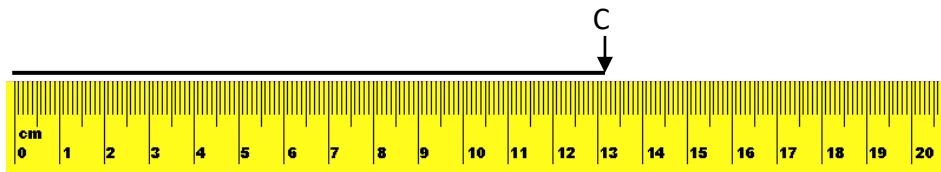
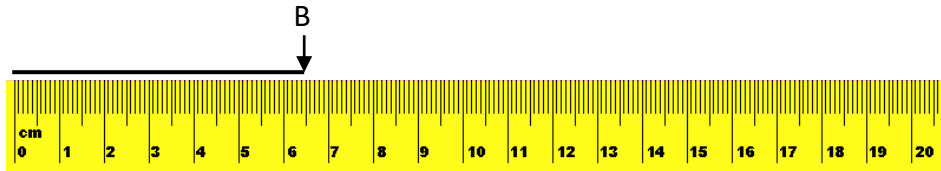
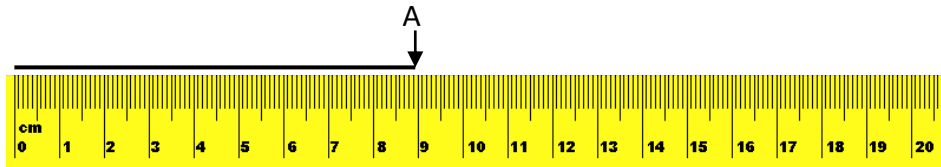
	<u>Centimetres</u>	<u>Millimetres</u>
A	9 cm	90 mm
B	1,5 cm or $1\frac{1}{2}$ cm	15 mm
C	3,5 cm	35 mm

4.1.2(5) a. Measure the following lines in centimetres e.g. 5,2 cm

4.1.3(5)



b. Read the length of the line on the ruler and complete.



	<u>Centimetres</u>	<u>Millimetres</u>
A		
B		
C		
D		

()

Memo a. A = 7,2 cm ; B = 1,9 cm ; C = 10,1 cm

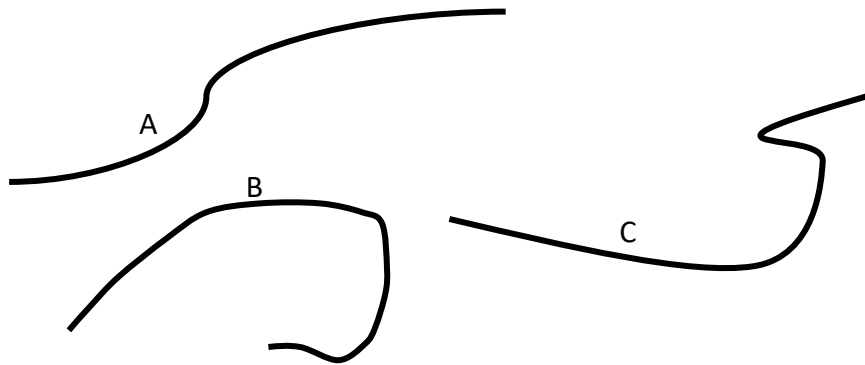
Allow 2 mm or 0,2 cm each way

b.

	<u>Centimetres</u>	<u>Millimetres</u>
A	9 cm	90 mm
B	6,5 cm	65 mm
C	13,2 cm	132 mm
D	4,8 cm	48 mm

4.1.2(6) a. Measure the length of the curves A – C in centimetres.

4.1.3(6)

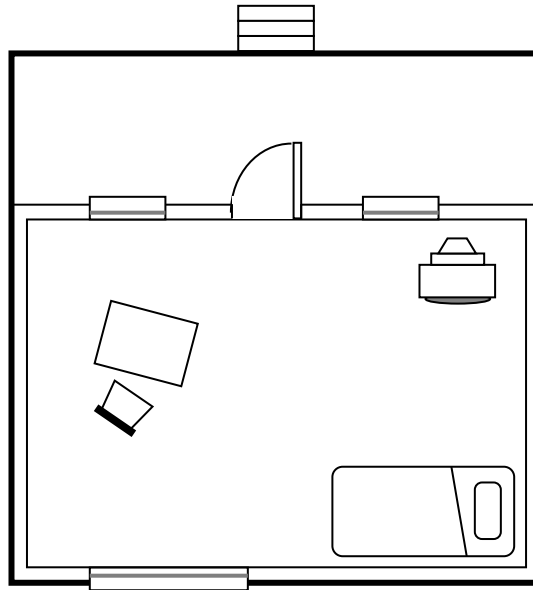


Write the lengths in order from shortest to longest.

b. Below is a plan of a bedroom.

Each 1 cm on your ruler = 1m in the bedroom.

Measure with your ruler and write the 'true' measurement.



- i) Width of each step=.....
- ii) Distance between the bed and the door =
- iii) Length of the bed =
- iv) Distance from the table to the door=.....
- v) Width of the widest window=.....

c. Which is bigger? Circle your answer.

25 mm or 2,7 cm

5 km or 500 m

600 cm or 6 km

546 mm or 54,6 m

Memo: a. A: 7,5 cm ; B: 8 cm ; C: 9 cm

Order: A; B; C

b. i) 1 m

ii) 3,6 m

iii) 2,4 m

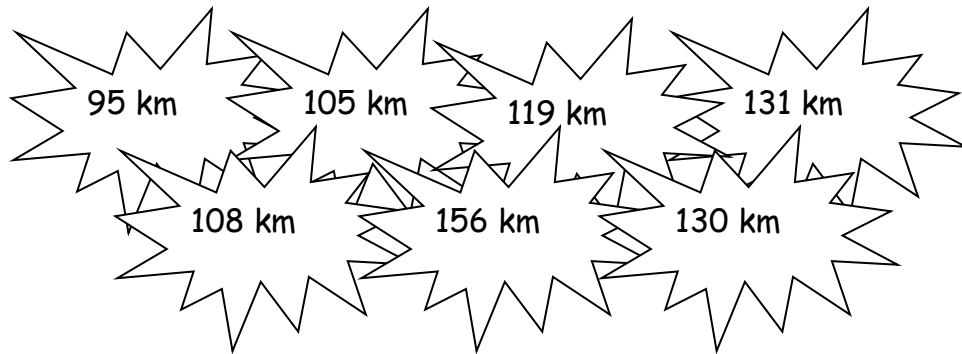
iv) 1,5 m

v) 2,0 M

c. 2,7 cm, 5 km, 6 km, 54,6 m

4.1.4 Calculations and problem-solving involving length

4.1.4(1)



Write in order from the longest to the shortest

()

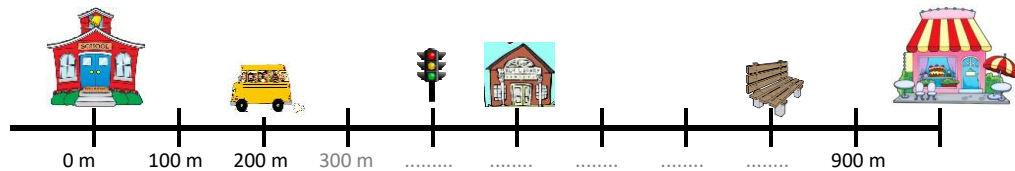
Memo: 156 km, 131 km, 130 km, 119 km, 108 km, 105 km, 95 km

4.1.4(2) a. Sara walked around a soccer field for 60 metres.

- Yusuf walked for 34 metres. How much further did Sara walk?
- Jan walked double the distance that Yusuf walked. How far did Jan walk?
- Fundi walked half the distance that Sara walked. How far did Fundi walk?

()

b.



Write down the distance between:

- The school and the traffic lightsm
- The school and the park bench
- The school and the sweet shop
- The traffic lights and the park bench
- The library and the sweet shop

Name places that are 100 metres apart.

Name two places that are 300 metres apart.

()

Memo: a. 26 m, 68 m, 30 m

b. 400 m, 800 m, 1 000 m, 400 m, 500 m

100 m = traffic light and library

300 m = library and bus or park bench and library

4.1.4(3) a. Sipho wrote down how far his friends' cars have driven.

46 674 km; 25 878 km; 11 895 km; 78 897 km; 2 499 km

i) Write these distances from the shortest to the longest.

ii) Estimate (by rounding off to the nearest 1 000 km) the total distance that all the cars have travelled.

iii) Calculate the total distance that all the cars have travelled.

()

b. Jess cycled 19 km and 300 metres this week and 33 km 40 metres last week. How far did she cycle altogether?

()

- c. A dress factory sells fabric in rolls of 25 metres each.

Complete the tables.

Number of rolls	1	2	3	4	5	6	7	8	9	10
Quantity of fabric (m)	25									

Number of rolls	10	20	30	40	50	60	70	80	90	100
Quantity of fabric (m)										

Use the information in the tables to answer the following questions.

- i) How much fabric is there in 27 rolls?
- ii) How much fabric is there in 83 rolls?
- iii) How much fabric is there in 79 rolls? ()
- d. It is 1 500 km from Cape Town to Suzi's home in Johannesburg. She wants to drive home from Cape Town in 3 days. If she wants to drive the same distance every day, how far must she drive every day? ()
- e. Solly uses 30 cm of thin wire to make a small wire toy.
- i) How many metres of wire does he need for 10 toys?
- ii) Solly buys 2m of thin wire. How many toys can he make? How much wire is left over? ()
- f. Complete.
- 500 mm =cm 25 cm =mm
- 700 cm =m 26 m =cm
- 6 000 m =km 8 km =m ()

Memo:

a. i) 2 499 km, 11 895 km, 25 878 km, 46 674 km, 78 897 km

ii) 47 000 km + 26 000 km + 12 000 km + 79 000 km + 2 000 km
= 166 000 km

iii) 165 843

b. $19,300 \text{ m} + 33,040 \text{ m} = 52,340 \text{ m}$

c.

Number of rolls	1	2	3	4	5	6	7	8	9	10
Quantity of fabric (m)	25	50	75	100	125	150	175	200	225	250

Number of rolls	10	20	30	40	50
Quantity of fabric (m)	250	500	750	1 000	1 250

Number of rolls	60	70	80	90	100
Quantity of fabric (m)	1 500	1 750	2 000	2 250	2 500

i) $27 \text{ rolls} = 500 \text{ m} + 175 \text{ m} = 675 \text{ m}$

ii) $83 \text{ rolls} = 2\,000 \text{ m} + 75 \text{ m} = 2\,075 \text{ m}$

iii) $79 \text{ rolls} = 70 \text{ rolls} + 9 \text{ rolls} = 1\,750 \text{ m} + 225 \text{ m} = 1\,975 \text{ m}$

d. $1\,500 \div 3 = 500 \text{ km}$

- e. i) $30 \text{ cm} \times 10 = 300 \text{ cm} = 3 \text{ m}$
 ii) $2 \text{ m} = 200 \text{ cm}$
 $200 \text{ cm} \div 30 = 6 \text{ toys and } 20 \text{ cm left over}$
- f. $500 \text{ mm} = 50 \text{ cm}$ $25 \text{ cm} = 250 \text{ mm}$
 $700 \text{ cm} = 7 \text{ m}$ $26 \text{ m} = 2\,600 \text{ cm}$
 $6\,000 \text{ m} = 6 \text{ km}$ $8 \text{ km} = 8\,000 \text{ m}$

4.1.4(4) a. Complete

_____ km _____ m = $5\frac{1}{2} \text{ km}$

4 km 750 m = _____ km

_____ km _____ m = $7\frac{1}{4} \text{ km}$

()

- b. Solly uses a $\frac{1}{4}$ metre of denim material to make one bag. How many bags can he make from 8 metres of material?

()

- c. Sally needs $1\frac{1}{3}$ metres of material to make one skirt. Complete the table.

Number of skirts	1	2	3	4	5	6	7	8	10
Metres of material	$1\frac{1}{3}$	$2\frac{2}{3}$							

()

- d. Mrs Faku makes school uniforms. She buys 4 rolls of grey material. There are $4\frac{1}{2}$ metres of material on each roll. How many metres does she buy altogether
- e. Mr Faku wants to put a fence around a field. The field is 72 metres long and 55 metres wide. How much fencing does he need?
- f. Mrs Twala has 20 metres of material. One dress uses $2\frac{1}{2}$ metres of material. Mrs Twala makes 4 dresses. How much material will she have left over?

()

()

()

Memo: a. $5 \text{ km } 500 \text{ m} = 5\frac{1}{2} \text{ km}$; 4,75 km ; 7 km 250 m

b. $8 \times 4 = 32$ bags

c.

Number of skirts	1	2	3	4	5	6	7	8	10
Metres of material	$1\frac{1}{3}$	$2\frac{2}{3}$	4	$5\frac{1}{3}$	$6\frac{2}{3}$	8	$9\frac{1}{3}$	$10\frac{2}{3}$	$13\frac{1}{3}$

d. $4\frac{1}{2} \text{ km} \times 4 = 18$ metres

e. $72 + 55 + 72 + 55 = 254$ metres

f. 2 dresses uses 5 m

4 dresses will use 10 m. She will have 10 metres left.

4.1.4(5) a. Complete.

760 mm = _____ cm

47 cm = _____ .mm

0,75 km = _____ m

2,5 km = _____ .m

180 cm = _____ mm

1 800 mm = _____ cm

150 cm = _____ m

0,25 m = _____ cm

0,76 m = _____ cm

220 cm = _____ m

()

b. Busi buys a used car which has already driven 150 000 km (the odometer reads 150 000). She has to take the car for a service every 15 000 km. Write down the odometer readings for the next 5 services.

()

c. Shaheeda uses 2,6 m of material for one dress. How much material will she need for 5 such dresses?

()

d. Soso's mother travels 24,4 km to work. This is 5,5 km further than her father has to travel. How far does Soso's father have to travel to work?

()

e. Lerato wants to cut a 1,4 m long ribbon into 4 equal pieces. How many metres long is each piece?
How many centimetres long is each piece?

()

Memo: a.

$$760 \text{ mm} = \mathbf{76} \text{ cm}$$

$$47 \text{ cm} = \mathbf{470} \text{ mm}$$

$$0,75 \text{ km} = \mathbf{750} \text{ m}$$

$$2,5 \text{ km} = \mathbf{2\ 500} \text{ m}$$

$$180 \text{ cm} = \mathbf{1\ 800} \text{ mm}$$

$$1\ 800 \text{ mm} = \mathbf{180} \text{ cm}$$

$$150 \text{ cm} = \mathbf{0,15} \text{ m}$$

$$0,25 \text{ m} = \mathbf{250} \text{ cm}$$

$$0,76 \text{ m} = \mathbf{760} \text{ cm}$$

$$220 \text{ cm} = \mathbf{0,22} \text{ m}$$

b. 165 000 km, 180 000 km, 195,000 km, 210,000 km, 225 000 km

c. 13 m

d. 18,9 km

e. 0,35 m = 35 cm

4.1.4(6) a. Complete.

$$9 \text{ mm} + 6 \text{ mm} + 11 \text{ mm} = \underline{\hspace{2cm}} \text{ cm}$$

$$2\frac{1}{4} \text{ km} + 3\frac{1}{4} \text{ km} = \underline{\hspace{2cm}} \text{ km}$$

$$95 \text{ cm} = \underline{\hspace{2cm}} \text{ mm}$$

$$2 \text{ m} + 300 \text{ cm} = \underline{\hspace{2cm}} \text{ m}$$

$$2\ 650 \text{ mm} = \underline{\hspace{2cm}} \text{ m}$$

$$2,89 \text{ m} = \underline{\hspace{2cm}} \text{ mm}$$

()

b. This table gives the distances travelled by a bus from Durban to Cape Town.

Durban → Port Shepsone	204 km	Durban → Humansdorp	986 km
Durban → Kokstad	242 km	Durban → Knysna	1 163 km
Durban → Umtata	417 km	Durban → George	1 224 km
Durban → East London	585 km	Durban → Heidelberg	1 385 km
Durban → King Williams Town	657 km	Durban → Swellendam	1 439 km
Durban → Grahamstown	777 km	Durban → Caledon	1 539 km
Durban → Port Alfred	851 km	Durban → Cape Town	1 654 km
Durban → Port Elizabeth	904 km		

i) Calculate the distance from Knysna to Caledon.

ii) Between which stops is the halfway point of the journey?

iii) If the bus just travels to George and then returns to Durban. How far would it have travelled?

()

- c. Selwyn travels about 3 000 km per month for work, and another 200 km per month for private matters.
- i) Approximately how far does he travel in one year?
- ii) Selwyn travels about half of this distance by car, and the other half by aeroplane. How far does he travel by car in a year? ()
- d. A snail climbs 75 cm up a garden wall each day. Each night it slips down 30 cm. The wall is 2,7 m high. If the snail started climbing on Monday, will it reach the top of the garden wall by Friday evening? (Show your working) ()

- Memo**
- a. 2,6 cm, $5\frac{1}{2}$ km, 950 mm, 2,3 m, 2,65 m, 2 890 mm
- b. i) 376 km
- ii) 827 km between Grahamstown and Port Alfred
- iii) 2 448 km
- c. $36\,000 + 2\,400 = 38\,400$ km Car 19 200 km
- d. $75 - 30 = 45$ cm $45 \times 5 = 2,25$ m
- No it will not get to the top of the wall.

4.2 Mass

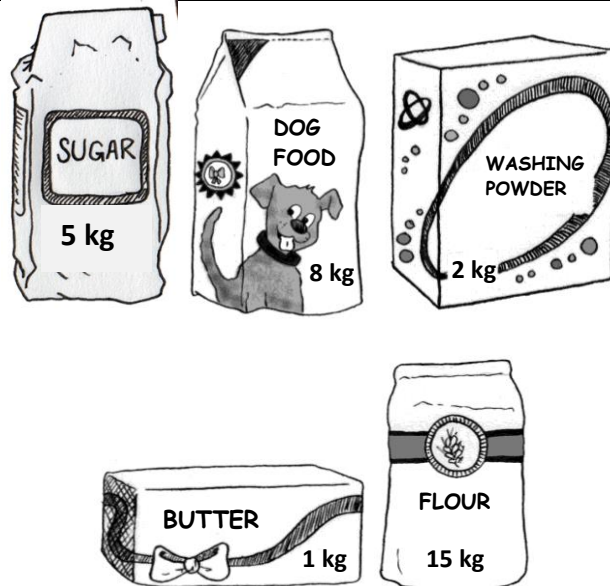
4.2.1 Practical Measuring – PRACTICAL

4.2.2 Measuring instruments

4.2.3 Units

4.2.2(1) a.

4.2.3(1)



Write in order from heaviest to lightest.

()

b. Which is heavier? Circle your answer.

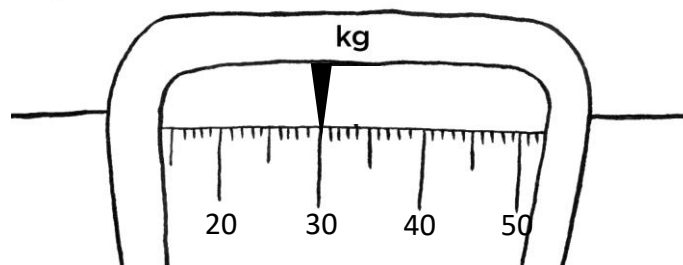
1 kg of bricks or 2 kg of rice

5 kg of water or 2 kg of cement

140 g of butter or 230 g of beach sand

()

c. Nandi stands on the scale.



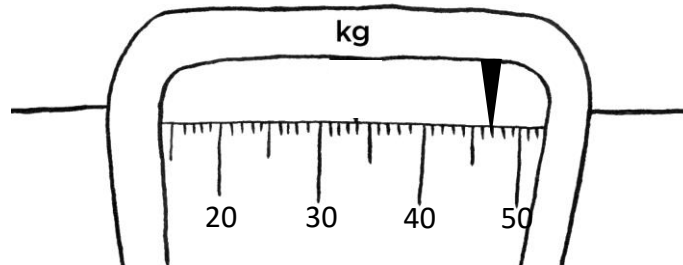
How much does she weigh?

()

- Memo**
- a. 15 kg ; 8 kg ; 5 kg ; 2 kg ; 1 kg
 - b. 2 kg rice ; 5 kg of water ; 320 g of beach sand
 - c. 30 kg

4.2.2(2) a. Angus stands on the scale.

4.2.3(2)



How much does he weigh?

()

b. Which is heavier? Circle your answer.

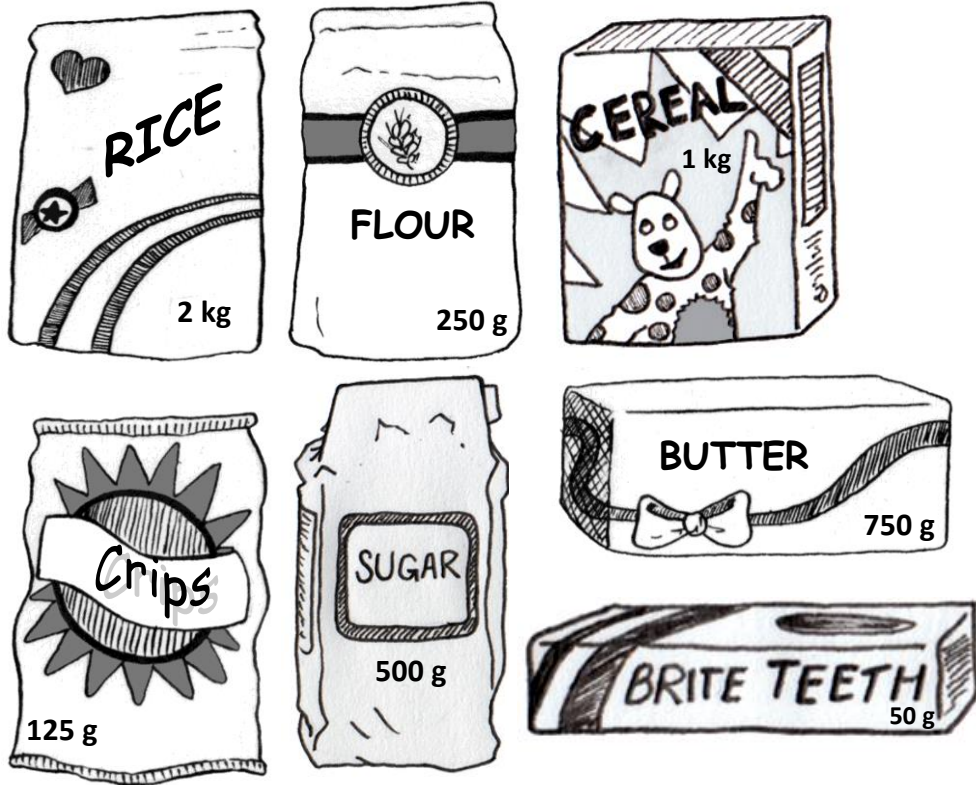
500 g of salt or 5 kg of ice

10 kg of dog food or 5 kg of cement

2 kg of flour or 20 g of salt

()

c.



Write in order from lightest to heaviest

()

Memo: a. 47 kg

b. 5 kg ice ; 5 kg cement ; 2 kg flour

c. 50 g; 125 g; 250 g; 500 g; 750 g; 1 kg; 2 kg

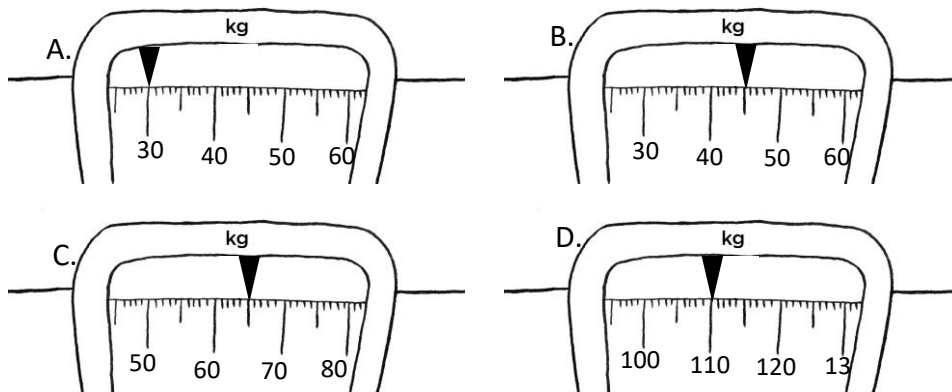
4.2.2(3) a. i) Would you use a bathroom scale or kitchen scale to measure 750 grams of butter?

4.2.3(3)

ii) Would you use a bathroom scale or kitchen scale to measure the mass of your suitcase?

()

b.



What masses are shown on these scales A – D?

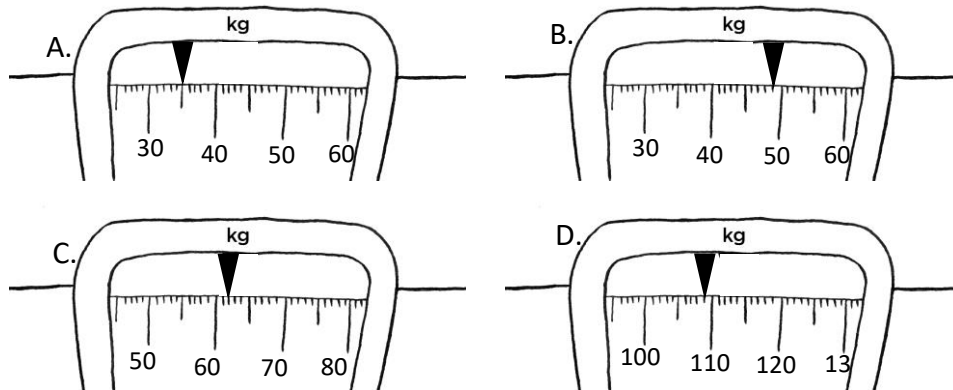
()

- Memo:** a. i) Kitchen scale ii) Bathroom scale
b. 30 kg; 45 kg; 65 kg; 110 kg

4.2.2(4)

a.

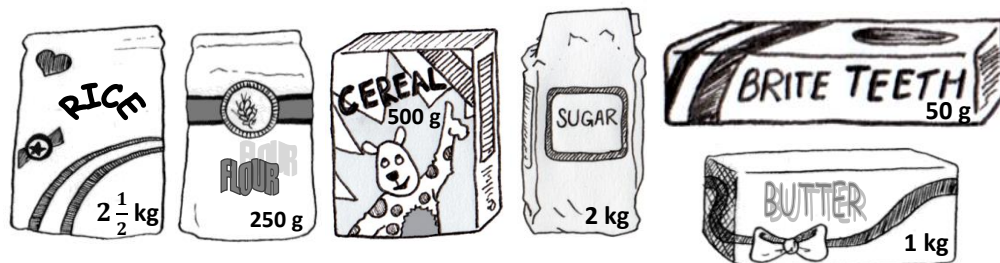
4.2.3(4)



What masses are shown on these scales A – D?

()

b.



Order from lightest to heaviest.

()

c. Which is heavier? Circle your answer.

$12\frac{1}{4}$ kg of sugar or 1 250 g of flour

150 g of rice or $1\frac{1}{2}$ kg of salt

()

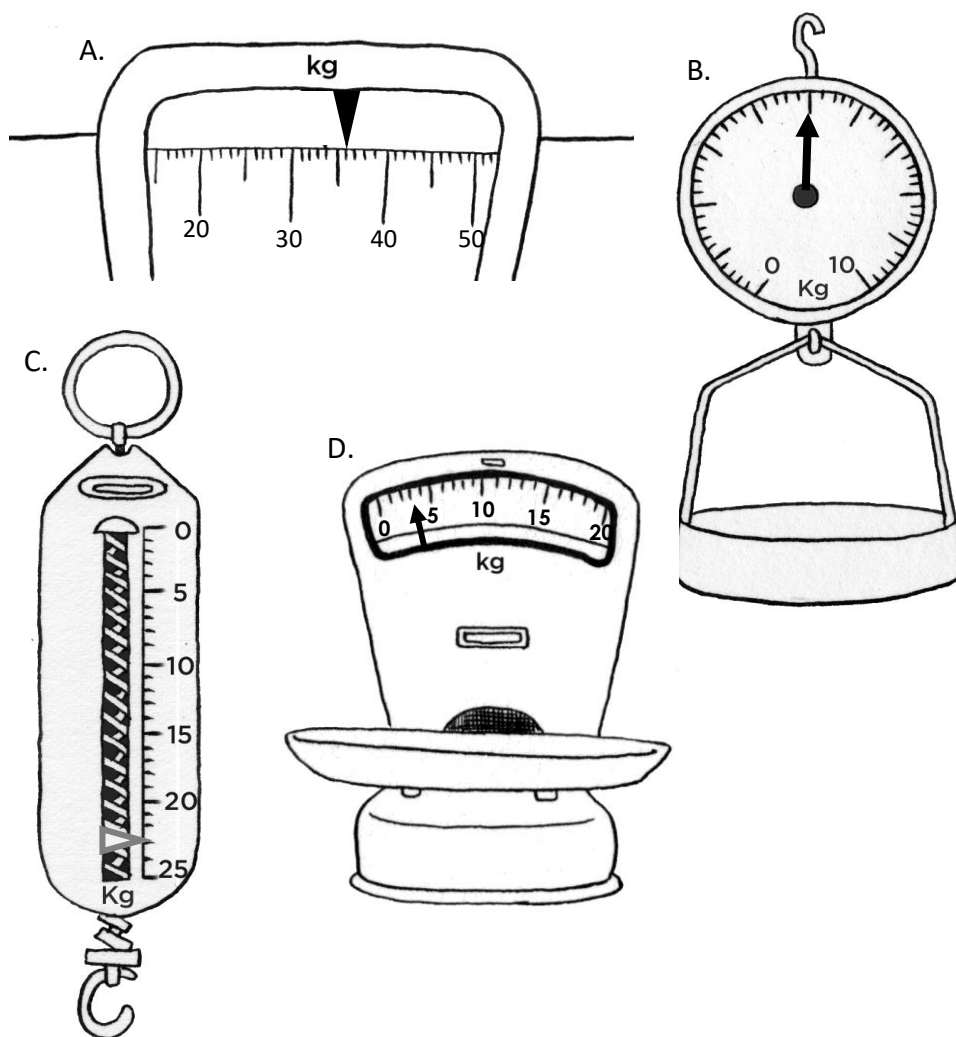
Memo a. A: 35 kg ; B: 49 kg ; C: 62 kg ; D: 109 kg

b. 50 g; 250 g; 500 g; 1 kg; 2 kg; $2\frac{1}{2}$ kg

c. $12\frac{1}{4}$ kg of sugar ; $1\frac{1}{2}$ kg of salt

4.2.2(5) a.

4.2.3(5)



What masses are shown on these scales A – D?

()

b. Name the unit of measurement you would use to weigh the following objects.

- i) A packet of dog food
- ii) A small packet of salt
- iii) A packet of powdered soup
- iv) A bicycle
- v) A cup of flour

()

Memo: a. A: 36 kg ; B: 5 kg ; C: 23 kg ; D: 3 kg

b. i) kg

ii) g

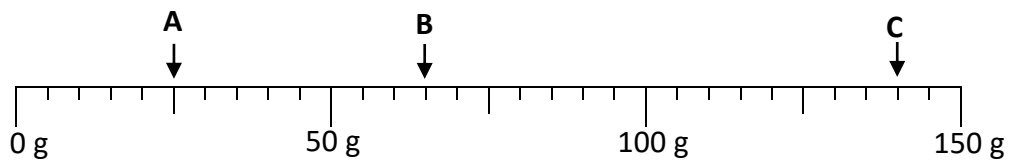
iii) g

iv) kg

v) g

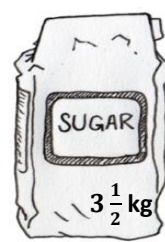
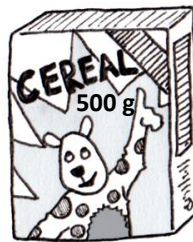
4.2.2(6) a.

4.2.3(6)



What masses are shown on these scales A - C? ()

b.






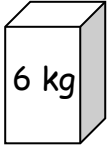
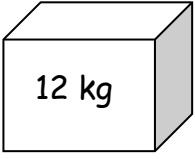
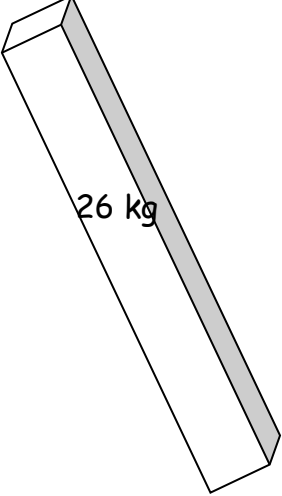
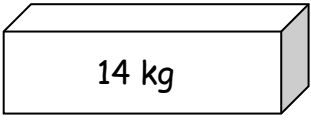
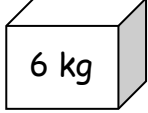
Order from the lightest to the heaviest. ()

Memo: a. A: 25 g ; B: 65 g ; 140 g

b. 50 g; 150 g; 240 g; 500 g; 1 kg; 2,5 kg; $3\frac{1}{2}$ kg

4.2.4 Calculations and problem solving

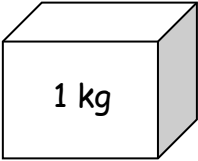
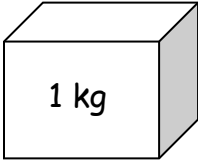
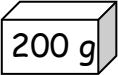
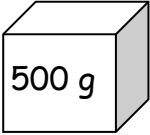
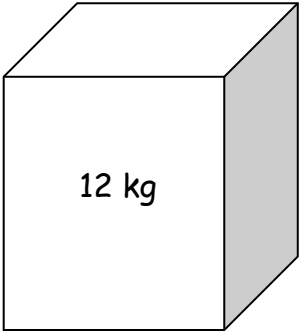
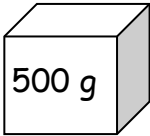
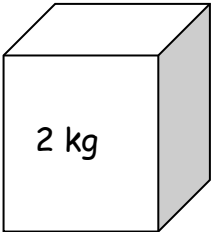
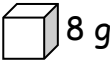
4.2.4(1) Complete.

		<u>TOTAL</u>
 1 kg	 1 kg	<i>Example:</i> $1\text{ kg} + 1\text{ kg} = 2\text{ kg}$
 2 kg	 6 kg	
 12 kg	 26 kg	
 14 kg	 6 kg	

()

Memo: 8 kg ; 38 kg ; 20 kg

4.2.4(2) Complete.

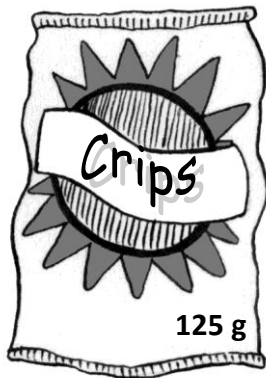
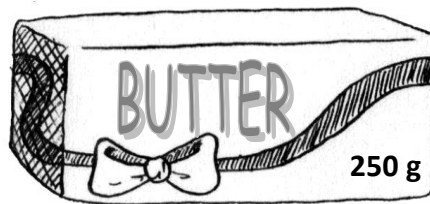
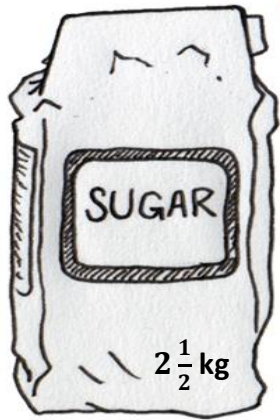
		<u>TOTAL</u>
		<i>Example:</i> $1\text{ kg} + 1\text{ kg} = 2\text{ kg}$
		
		
		

()

Memo: 700 g ; 12 kg 500 g (Also accept 12,5 kg and 12 500 g) ;
2 kg 8 g (Also accept 2,008 kg and 2 008 g)

- 4.2.4(3) a. A packet of biscuits weighs 240 g. There are 12 biscuits in each packet. How much does each biscuit weigh? ()
- b. The baker uses 500 g of flour to bake a cake. He has 6 kg of flour. How many cakes can he bake? ()

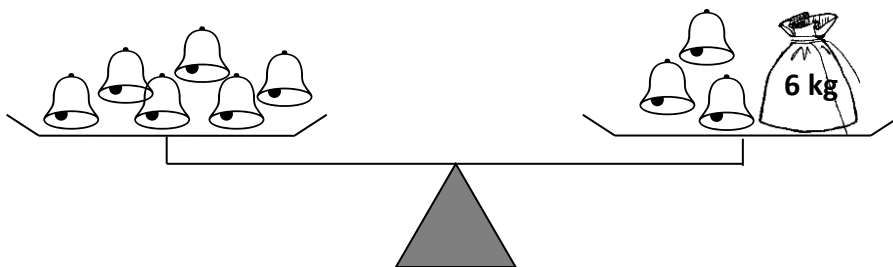
c.



- i) How many bricks of butter will weigh the same as a box of cereal?
- ii) How many bricks of butter will weigh the same as a bag of sugar?
- iii) What will 2 boxes of cereal weigh?
- iv) Will 3 boxes of cereal weigh more, less, or the same as the packet of sugar? Explain

()

d. The two sides are balanced.



What is the mass of one of the bells?

()

Memo: a. 20 g

b. 12 cakes

- c. i) 3 bricks of butter
 ii) 10 bricks of butter
 iii) 1,5 kg or 1 500 g
 iv) 3 boxes of cereal weighs 2 250 g or 2,25 kg
 3 boxes of cereal will weigh less than the sugar.
- d. 2 kg

4.2.4(4) a. Sita buys a 10 kg bag of sugar.

- i) How many smaller bags of $2\frac{1}{2}$ kg of sugar can she fill from the big bag? ()
- ii) How many smaller bags of 500 g can she fill from the big bag? ()

b. Complete

$$3\frac{1}{2} \text{ kg} = \underline{\hspace{2cm}} \text{ g}$$

$$6\frac{1}{4} \text{ kg} = \underline{\hspace{2cm}} \text{ g}$$

$$5\,000 \text{ g} = \underline{\hspace{2cm}} \text{ kg} \quad ()$$

c. Complete the table.

Bricks	1	2	3	4	5	6	8	10	12
kg	$2\frac{1}{2}$								

()

d. Ben uses these ingredients to make 1 cake.

1 egg
$\frac{1}{2}$ cup oil
3 cups flour
$1\frac{1}{2}$ cups milk
$1\frac{1}{4}$ cups sugar
$2\frac{1}{2}$ teaspoons baking soda

How much of each ingredient will Ben need to bake 4 cakes?

()

Memo: a. i) 4 smaller bags of $2\frac{1}{2}$ kg

ii) 20 500 g bags

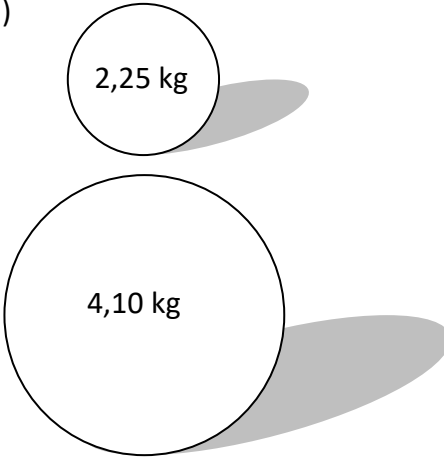
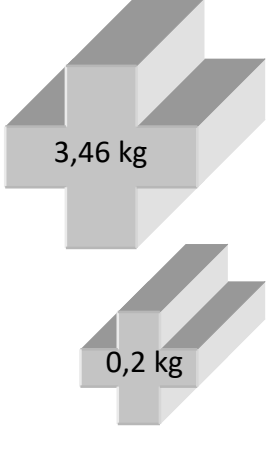
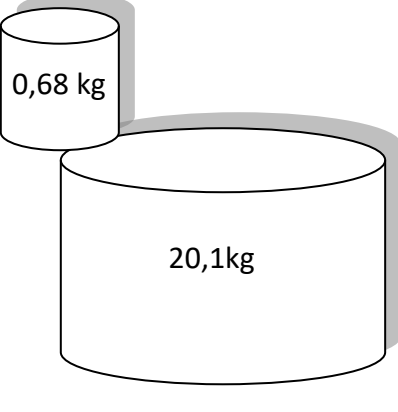

b. 3 500 g ; 6 250 g ; 5 kg

c.

Bricks	1	2	3	4	5	6	8	10	12
kg	$2\frac{1}{2}$	5	$7\frac{1}{2}$	10	$12\frac{1}{2}$	15	20	25	30

d. 4 eggs ; 2 cups of oil ; 12 cups of flour ; 6 cups milk ; 5 cups sugar ; 10 teaspoons of baking soda

4.2.4(5) a. Find the total mass

<p>i)</p> 	<p>ii)</p> 
<p>iii)</p> 	<p>iv)</p> 

()

b. Complete.

..... kg = $7\frac{1}{2}$ kg =g

2,50 kg = kg = g

..... kg = kg = 3 750 g

()

c. Mrs Brown buys a 15 kg bag of sugar. She uses it to make smaller packets of 2,5 kg each.

i) How many smaller packets can she fill?

ii) How many grams of sugar are there in a smaller packet?

()

d. Amos's recipe for one meat loaf asks for 0,7 kg of minced meat. How much mince does he need for 10 meat loaves?

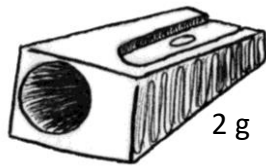
()

()

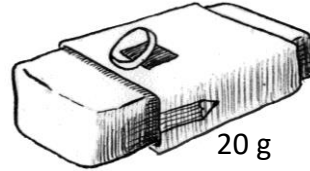
Memo:

a.	i)	6,35 kg	ii)	3,66 kg
	iii)	20,78 kg	iv)	4,92 kg
b.	$7,5 \text{ kg} = 7\frac{1}{2} \text{ kg} = 7\,500 \text{ g}$			
	$2,50 \text{ kg} = 2\frac{1}{2} \text{ kg} = 2\,500 \text{ g}$			
	$3,75 \text{ kg} = 3\frac{3}{4} \text{ kg} = 3\,750 \text{ g}$			
c.	i)	6 bags	ii)	2 500 g
d.	7 kg of meat			
e.	$4\frac{4}{5} \text{ kg of flour}$			

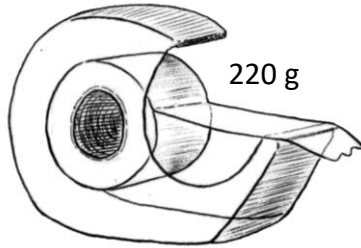
4.2.4(6) a.



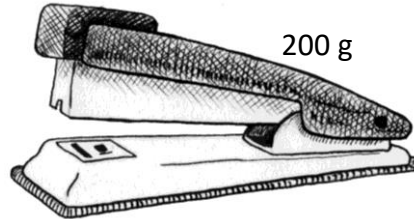
2 g



20 g



220 g



200 g

Complete.

	MASS	
	<u>Grams</u>	<u>Kilograms</u>
10 sharpeners		
20 sharpeners		
10 erasers		
50 erasers		
50 staplers		
2 tape holders		
20 tape holders		

()

- b. Sandra wants to make up a parcel for charity. The parcel cannot weigh more than 3 kg and the contents must contain jam, fruit and coffee.

She can choose the following:

900 g tins of jam 820 g tins of fruit 500 g tins of coffee

450 g tins of jam 410 g tins of fruit 250 g tins of coffee

What should she pack in the parcel?

()

c. Complete.

1 kg = _____ g

3 000 g = _____ kg

800 g = _____ kg

0,75 kg = _____ g

0,1 kg = _____ g

85 g = _____ kg

()

d. Circle the closest estimate of the mass of each object.

A large man

30 kg	100 kg	500 kg	50 g
-------	--------	--------	------

A small packet of chips.

45 kg	130 g	500 g	1 kg
-------	-------	-------	------

A bar of soap.

10 g	1 kg	500 g	100 kg
------	------	-------	--------

A cow

400 kg	50 kg	1 000 kg	300 g
--------	-------	----------	-------

()

e. A brick weighs 2,5 kg. What is the most number of bricks that Andy could load onto his bakkie if their total mass cannot be more than 500 kg?

()

f. Tobeka uses 500 g of meat to make a meal.

i) How much meat would she need to make 7 of this meal?

ii) Tobeka buys 12 kg of meat. What is the most number of these meals could she make?

()

Memo: a.

	MASS	
	<u>Grams</u>	<u>Kilograms</u>
10 sharpeners	20 g	0,02 kg
20 sharpeners	40 g	0,04 kg
10 erasers	200 g	0,2 kg
50 erasers	1 000 g	1 kg
50 staplers	10 000 g	10 kg
2 tape holders	440 g	0,44 kg
20 tape holders	4 400 g	4,4 kg

- b. *There are many possible answers. The more that is put in the basket the better. Some answers could be:*

2 × 450 g tins jam, a 410 g tin of fruit and 3 × 500 g tins of coffee OR

2 × 900 g tins of jam, a 410 tin of fruit and a 500 g tin of coffee OR ...

- c. 1 kg = **1 000 g** 3 000 g = **3 kg**
800 g = **0,8 kg** 0,75 kg = **750 g**
0,1 kg = **100 g** 85 g = **0,085 kg**

- d. A large man ≈ 100 kg
Small packet of chips ≈ 130 g
A bar of soap ≈ 10 g
A cow ≈ 400 kg

- e. 200 bricks

- f. i) 3 500 g = 3,5 kg
ii) 24 meals

4.3 Capacity / Volume

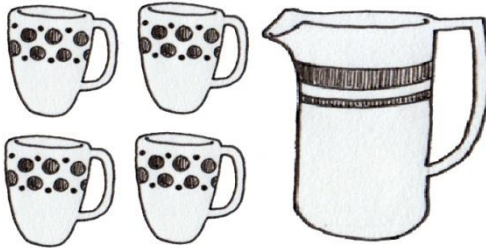
4.3.1 Practical Measuring - PRACTICAL

4.3.2 Measuring instruments

4.3.3 Units

4.3.4 Calculations and problem solving

4.3.2(1) a.



4.3.3(1)

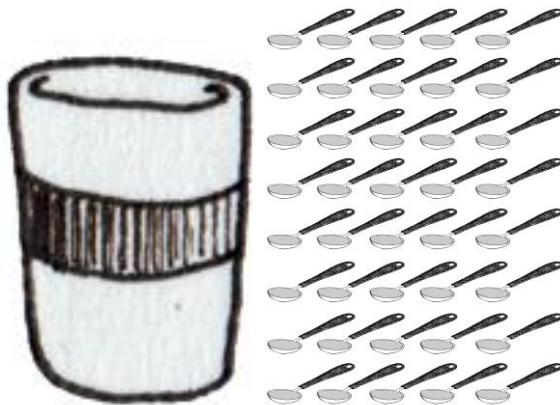
4.3.4(1)

4 mugs fill this jug.

- i) How many mugs will fill 2 jugs?
- ii) How many mugs will fill 10 jugs?
- iii) How many mugs will fill $\frac{1}{2}$ a jug?
- iv) Which has more water in it, 9 mugs or 2 jugs?

()

b.



40 teaspoons fill this cup.

- i) How many spoons fill 3 cups?
- ii) How many spoons fill $\frac{1}{2}$ a cup?
- iii) Which has more salt in it, 100 spoons or 2 cups?

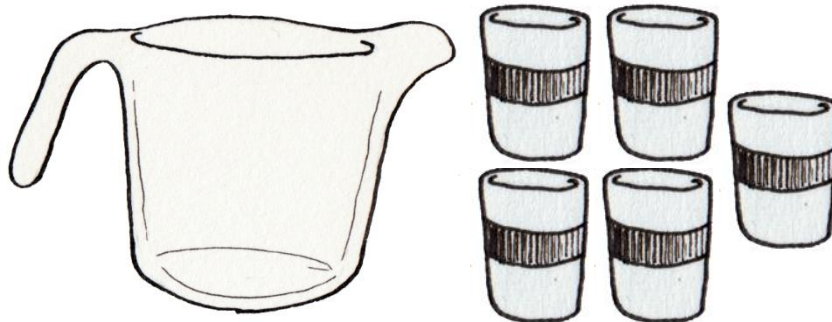
()

- Memo:**
- a.
 - i) 8 mugs
 - ii) 40 mugs
 - iii) 2 mugs
 - iv) 9 mugs
 - b.
 - i) 120 spoons
 - ii) 20 spoons
 - iii) 100 spoons

4.3.2(2) a.

4.3.3(2)

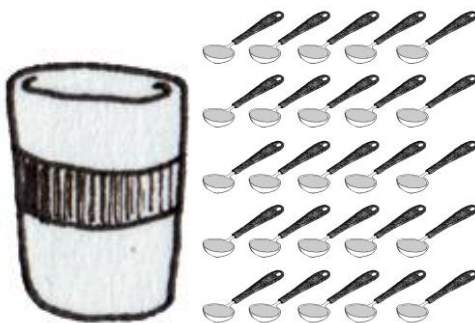
4.3.4(2)



5 cups fill this jug.

- i) How many cups will fill 10 jugs?
- ii) How many cups will fill $\frac{1}{2}$ a jug?
- iii) Which has more water in it, 11 cups or 2 jugs? ()

b.



25 teaspoons fill this cup.

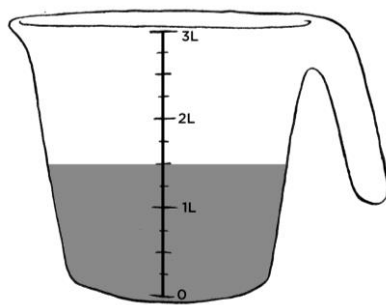
- i) How many spoons fill 5 cups?
- ii) How many spoons fill $\frac{1}{2}$ a cup?
- iii) Which has more salt in it, 150 spoons or 7 cups? ()

- Memo:**
- a.
 - i) 50 cups
 - ii) $2\frac{1}{2}$ cups
 - iii) 11 cups
 - b.
 - i) 125 spoons
 - ii) $12\frac{1}{2}$ spoons
 - iii) 7 cups

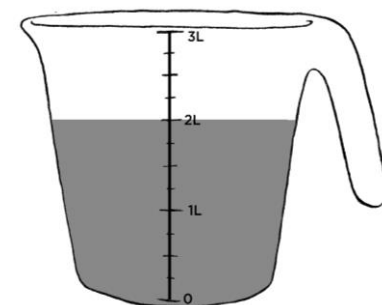
4.3.2(3)

a.

A.

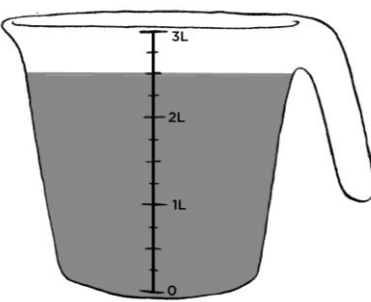


B.



4.3.3(3)

C.



How much water is in each of the measuring jugs?

()

b. Underline the correct word in brackets.

- My mother gives me (5 millilitres or 5 litres) of cough medicine when I have a cold.
- The driver filled the taxi with (40 millilitres or 40 litres) of petrol at the garage.
- You buy milk in a (2 millilitre or 2 litre) bottle.
- A cup will hold (250 mℓ or 250 ℓ) of tea.

()

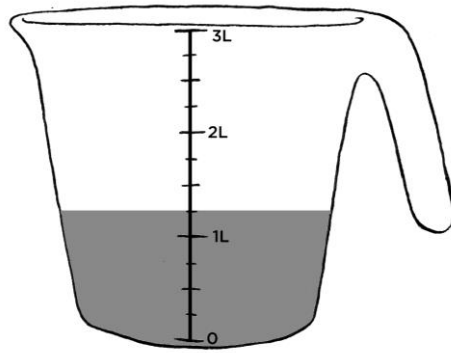
Memo: a. $1\frac{1}{2}$ litre; 2 litres; $2\frac{1}{2}$ litres

b. 5 millilitres ; 40 litres ; 2 litres ; 250 mℓ

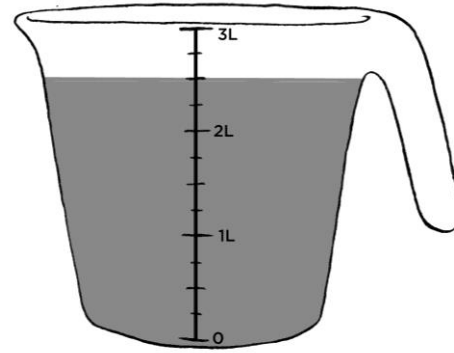
4.3.2(4) a.

4.3.3(4)

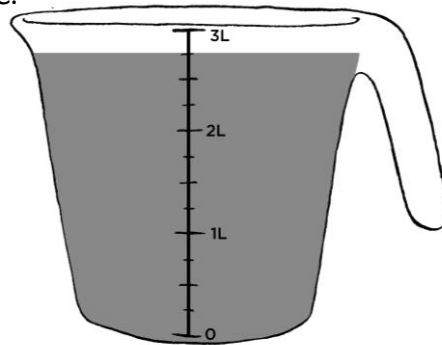
A.



B.



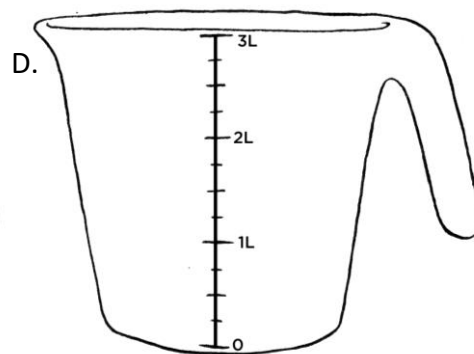
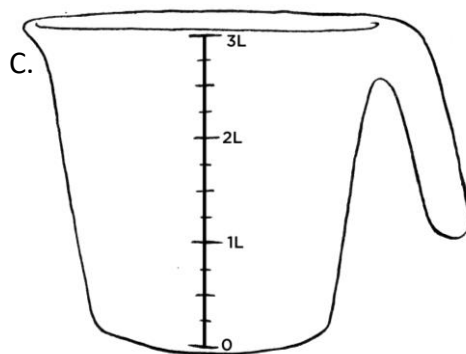
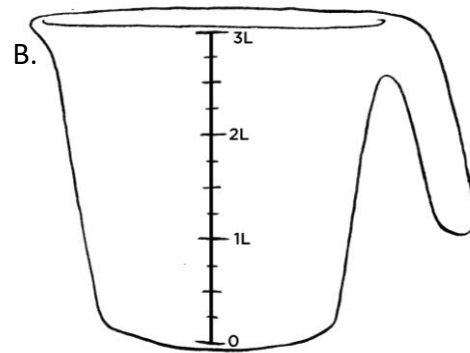
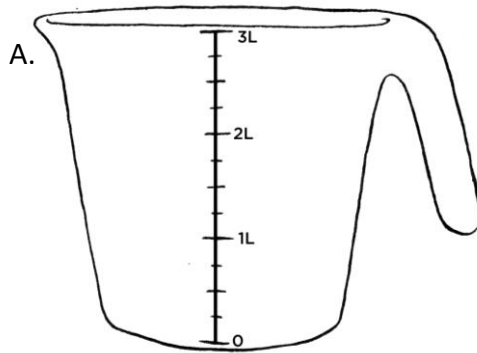
C.



How much water is in each of the measuring jugs?

()

- b. i) Mark the level of water in jug A at $1\frac{1}{4}$ ℓ.
 ii) Mark the level of water in jug B at 2 ℓ.
 iii) Mark the level of water in jug C at $2\frac{3}{4}$ ℓ.
 iv) Mark the level of water in jug D at $1\frac{1}{2}$ ℓ.



()

- c. Underline the correct word in brackets.

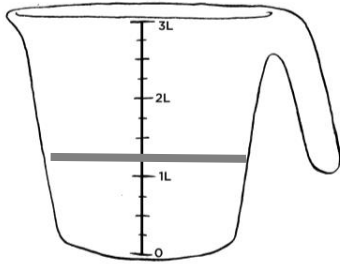
- My sister had to take (10 mℓ or 10 ℓ) of medicine a day for her cold.
- A bucket contains (10 mℓ or 10 ℓ) of water.
- A can contains (330 mℓ or 330 ℓ) of cooldrink when full.

()

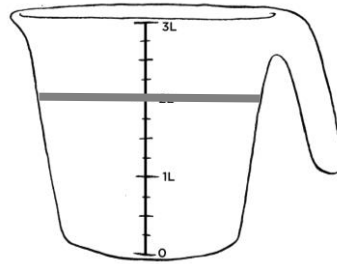
Memo: a. $1\frac{1}{4}$ ℓ ; $2\frac{1}{2}$ ℓ ; $2\frac{3}{4}$ ℓ

b.

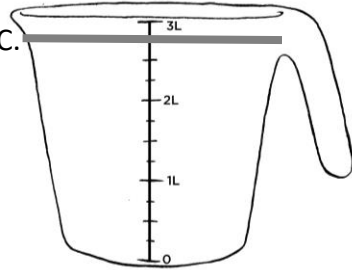
A.



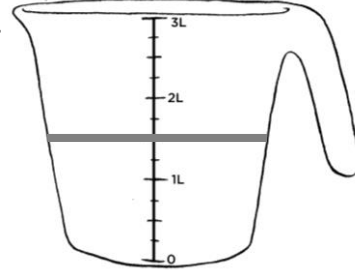
B.



C.



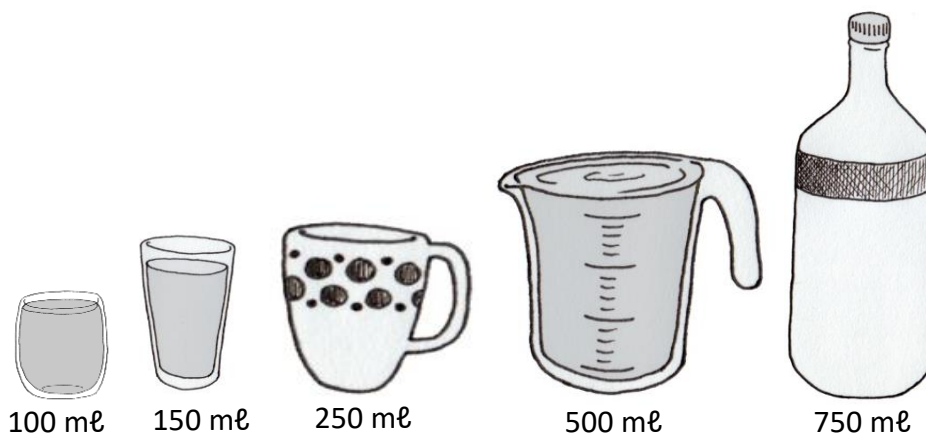
D.



c. 10 mL ; 10 L ; 330 mL

4.3.2(5) a.

4.3.3(5)



Circle all the containers that can be filled to the given capacity.

Capacity	
2 ℓ	
2,5 ℓ	
$2\frac{3}{4}$ ℓ	

()

b. Convert the following amounts:

i) $2,5 \ell = \underline{\hspace{2cm}} \text{ mL}$

ii) $3\frac{3}{4} \ell = \underline{\hspace{2cm}} \text{ mL}$

iii) $78\,000 \ell = \underline{\hspace{2cm}} \text{ k}\ell$

iv) $15\,000 \text{ mL} = \underline{\hspace{2cm}} \ell$

v) $2,6 \text{ k}\ell = \underline{\hspace{2cm}} \ell$

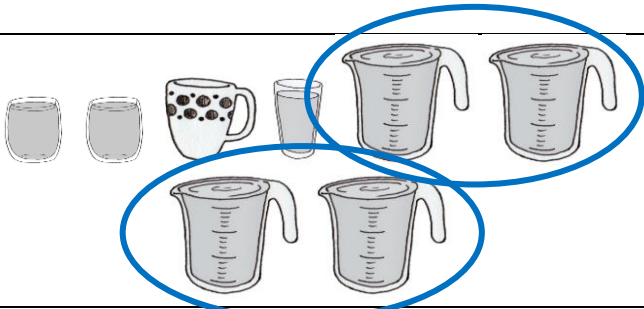

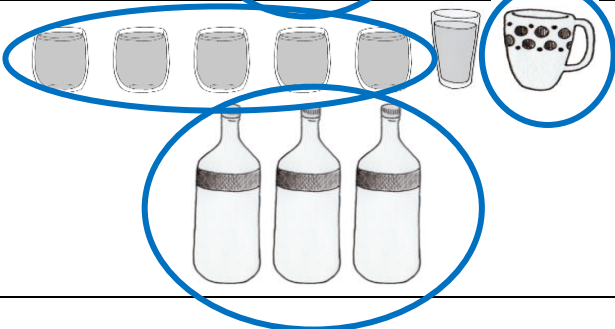
()

c. Underline the correct word in brackets.

- A large water tank collecting rain water from the roof of a house holds (250 mL / 5 kℓ / 500 ℓ / $20\frac{1}{4} \ell$) of water.
- A large medicine bottle has (200 mL / 200 ℓ / 750 mL / 750 ℓ) of cough syrup in it.
- 3 medicine teaspoons of cough syrup is the same as (75 mL / 10 mL / 15 mL / 20 mL)

()

Memo: a.

Capacity	
2 ℓ	
2,5 ℓ	
$2\frac{3}{4}$ ℓ	

b. i) $2,5 \ell = 2\,500 \text{ m}\ell$

ii) $3\frac{3}{4} \ell = 3\,750 \text{ m}\ell$

iii) $78\,000 \ell = 78 \text{ k}\ell$

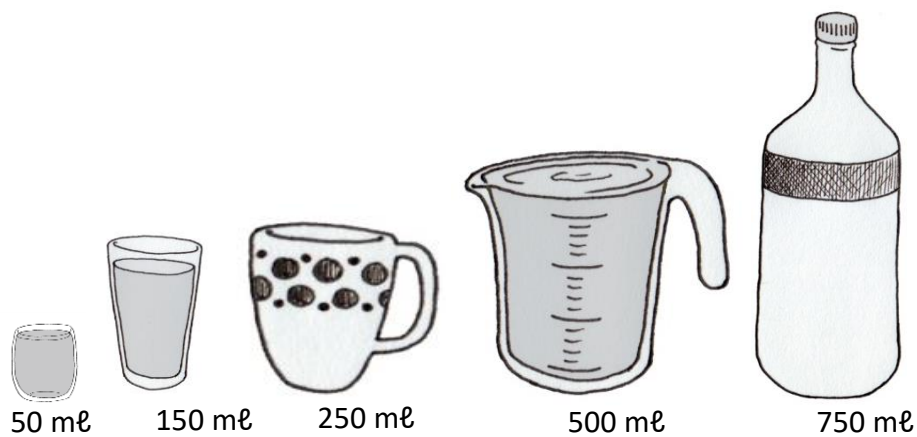
iv) $15\,000 \text{ m}\ell = 15 \ell$

v) $2,6 \text{ k}\ell = 2\,600 \ell$

c. $5 \text{ k}\ell$; $200 \text{ m}\ell$; $15 \text{ m}\ell$

4.3.2(6) a.

4.3.3(6)

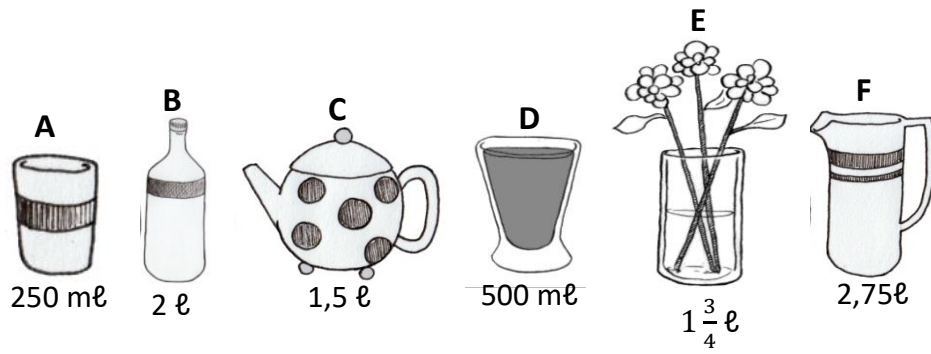


Circle all the containers that can be filled to the given capacity.

Capacity	
0,5 ℓ	
1,75 ℓ	
$2\frac{3}{4}$ ℓ	


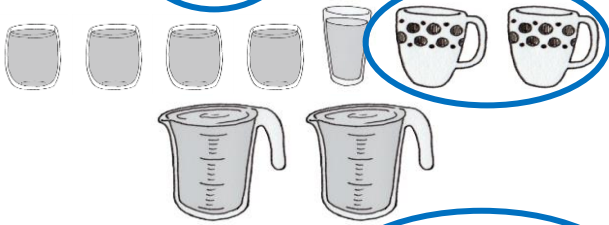


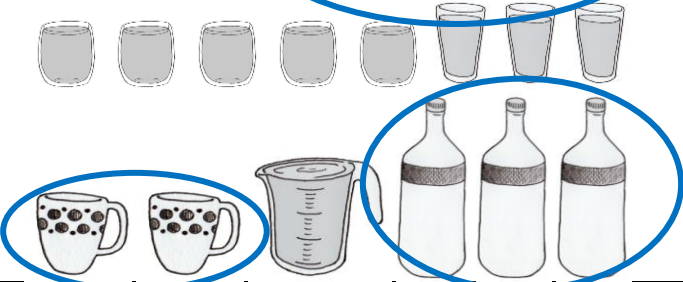
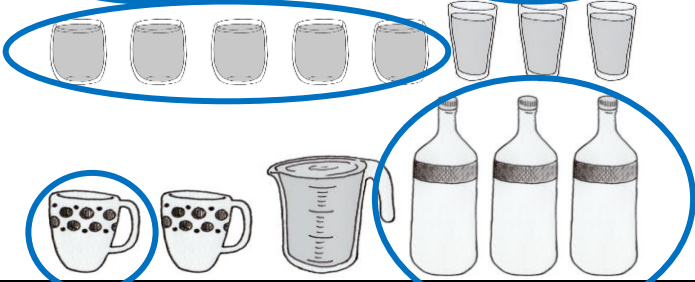
()

b.



- Which container (A – F) can hold the most liquid?
- What is the difference in capacity between containers B and E?
- What is the total capacity of container C and D?
- How many 250 mℓ cups can fill container E?
- How many 500 mℓ glasses can be filled from 2,75 ℓ of water? How many mℓ will be left over?

()

Memo: a	Capacity	
	0,5 ℓ	
	OR 0,5 ℓ	
	1,75 ℓ	
	$2\frac{3}{4}$ ℓ	
	OR $2\frac{3}{4}$ ℓ	
	OR $2\frac{3}{4}$ ℓ	

- b. i) F
- ii) $\frac{1}{4}$ ℓ or 250 mℓ
- iii) 2ℓ
- iv) 7 cups
- v) 5 glasses and 250 mℓ left

4.3.4 More calculations and problem solving

4.3.4(3) a. A teaspoon has a capacity of 5 mL.

A tablespoon has a capacity of 15 mL.

1 cup has a capacity of 250 mL.

i) What will be the capacity of 32 teaspoons?

ii) What is the capacity of 6 tablespoons?

iii) How much milk will be in 8 cups? ()

b. How much more liquid needs to be added to the following to make 1 litre?

i) 750 mL ii) 500 mL

iii) 330 mL iv) 250 mL

v) 200 mL vi) 300 mL ()

c. Jabu is pouring cooldrink for her 6 friends into plastic cups. Each cup holds 200 mL of cooldrink. She has 2 L of cooldrink. Will she have enough for her friends and herself? Explain your answer. ()

d. Baby Amos drinks 6 bottles of milk during the day. Each bottle contains 150 mL of milk. How many millilitres does Amos drink during the day? ()

4.3.4(3)	<p>a. A teaspoon has a capacity of 5 mL.</p> <p>A tablespoon has a capacity of 15 mL.</p>
----------	---

1 cup has a capacity of 250 mL.

- i) What will be the capacity of 32 teaspoons?
- ii) What is the capacity of 6 tablespoons?

ii) What is the capacity of 6 tablespoons?

iii) How much milk will be in 8 cups? ()

iii) How much milk will be in 8 cups? ()

b. How much more liquid needs to be added to the following to make 1 litre?

b. How much more liquid needs to be added to the following to make 1 litre?

i) 750 mℓ ii) 500 mℓ

i) 750 mℓ	ii) 500 mℓ
iii) 330 mℓ	iv) 250 mℓ

i) 750 mℓ	ii) 500 mℓ
iii) 330 mℓ	iv) 250 mℓ

iii) 330 mℓ	iv) 250 mℓ	
v) 200 mℓ	vi) 300 mℓ	()

iii) 330 mℓ	iv) 250 mℓ	
v) 200 mℓ	vi) 300 mℓ	()

v) 200 mℓ vi) 300 mℓ (_)

c. Jabu is pouring cooldrink for her 6 friends into plastic cups. Each cup holds

v) 200 mℓ vi) 300 mℓ (_)

c. Jabu is pouring cooldrink for her 6 friends into plastic cups. Each cup holds

c. Jabu is pouring cooldrink for her 6 friends into plastic cups. Each cup holds 200 mL of cooldrink. She has 2 L of cooldrink. Will she have enough for her friends and herself? Explain your answer. ()

d. Baby Amos drinks 6 bottles of milk during the day. Each bottle contains 150 mL of milk. How many millilitres does Amos drink during the day? ()

d. Baby Amos drinks 6 bottles of milk during the day. Each bottle contains 150 mℓ of milk. How many millilitres does Amos drink during the day? ()

Memo:	a.	i)	160 mL
		ii)	90 mL

ii)	90 mℓ
iii)	2 ℓ or 2 000mℓ

	iii)	2 ℓ or 2 000mℓ	
b	i)	250 mℓ or 0,25 ℓ	ii) 500 mℓ or 0,5 ℓ

b	i)	250 ml or 0,25 l	ii)	500 ml or 0,5 l
	iii)	670 ml or 0,67 l	iv)	750 ml or 0,75 l

b	i)	250 ml or 0,25 l	ii)	500 ml or 0,5 l
	iii)	670 ml or 0,67 l	iv)	750 ml or 0,75 l

iii) 670 mℓ or 0,67 ℓ	iv) 750 mℓ or 0,75 ℓ
v) 800 mℓ or 0,8 ℓ	vi) 700 mℓ or 0,7 ℓ

iii) 670 mℓ or 0,67 ℓ	iv) 750 mℓ or 0,75 ℓ
v) 800 mℓ or 0,8 ℓ	vi) 700 mℓ or 0,7 ℓ

v) 800 mL or 0,8 L vi) 700 mL or 0,7 L

c. Yes. 6 cups will be $6 \times 200 \text{ mL}$ which is 1 200 mL or 1,2 L. This is less than

v) 800 mL or 0,8 L vi) 700 mL or 0,7 L

c. Yes. 6 cups will be $6 \times 200 \text{ mL}$ which is 1 200 mL or 1,2 L. This is less than

c. Yes. 6 cups will be $6 \times 200 \text{ mL}$ which is 1 200 mL or 1,2 L. This is less than the 2 L. *Accept other correct explanations.*

d. 900 mL

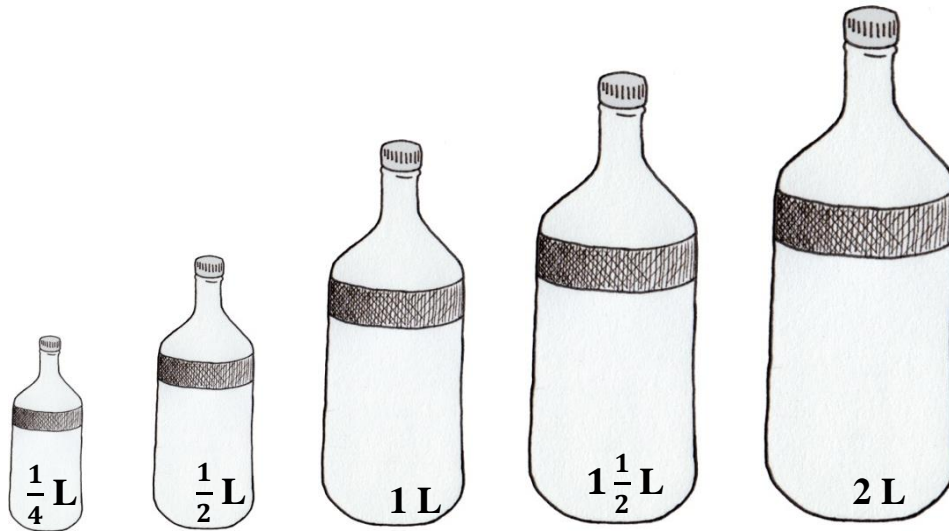
d. 900 mL

4.3.4(4)	a.	Joe's glass holds 300 mL. How many glasses can he fill with 6 litres of milk?	()
----------	----	---	-----

b. A doctor wants a baby to receive 1 teaspoon of medicine 3 times a day for 14 days. A teaspoon holds 5 mℓ of medicine. How many millilitres of medicine must the mother buy? ()

c. If you can fill 6 glasses from one 750 mℓ of cooldrink. How much cooldrink will there be in 1 glass? ()

d.



Petros wants to buy 3 ℓ of juice. Write down 5 different ways he can buy 3 ℓ of juice using the bottles above. He can buy as many of each bottle as he likes. ()

Memo: a. 20 glasses

b. 210 mℓ

c. 125 mℓ

d. *Several possible answers, these include:*

$$2\ell + 1\ell ; 2 \times 1\frac{1}{2}\ell ; 3 \times 1\ell ; 2\ell + 2 \times \frac{1}{2}\ell ; 6 \times \frac{1}{4}\ell$$

4.3.4(5) a. A taxi uses 11,50 ℓ of petrol to travel from Hermanus to Cape Town.

The taxi drives to Hermanus and back to Cape Town every day of the week. How many litres of petrol will the taxi use in the week? ()

b. Convert the following amounts:

i) $3\frac{4}{10} \ell = 3 \ell$ and _____ mℓ

ii) $0,750 \ell =$ _____ mℓ

iii) $450 \ell =$ _____ kℓ

iv) $2\frac{1}{4} \text{ kℓ} =$ _____ ℓ

()

c. Mother makes porridge for breakfast. For each bowl of porridge, she uses 0,25 ℓ of milk.

i) If she makes 6 bowls of porridge, how much milk does she need?

ii) If she has 5 ℓ of milk. How many bowls of porridge can she prepare?

()

d. Victoria uses this recipe to bake a simple chocolate cake.

Simple chocolate cake

2 cups flour

$1\frac{1}{2}$ tablespoons cocoa

$1\frac{1}{2}$ cups sugar

2 teaspoons baking powder

$\frac{1}{2}$ cup of melted butter

$\frac{3}{5}$ of a cup of milk

2 eggs

1 teaspoon vanilla essence

Conversions:

One cup = 250 mℓ

One teaspoon = 5 mℓ

One tablespoon = 15 mℓ

Write all the quantities in this recipe in millilitres

()

e. Sipho must take 1 teaspoon of medicine every day. There are 100 millilitres of medicine in the bottle. How many days will it take for the medicine to finish? (1 teaspoon = 5 mℓ)

Memo: a. 161 ℓ for 7 trips.

b. $3 \ell 400 \text{ mℓ} = 3,4 \text{ mℓ}$; 750 mℓ ; 0,45 kℓ ; 2 250 ℓ

c. $1\frac{1}{2} \ell$ or 1,5 ℓ ; 20 bowls

- d. 500 mℓ of flour ; 22,5 mℓ of cocoa ; 375 mℓ sugar ; 10 mℓ baking powder ; 125 mℓ butter ; 150 mℓ milk ; 5 mℓ vanilla essence
- e. 20 days.

4.3.4(6) a. Convert the following amounts:

i) $8\frac{6}{10} \ell = 8 \ell$ and _____ mℓ

ii) 0,250 ℓ = _____ mℓ

iii) 1 650 ℓ = _____ kℓ

iv) $2\frac{3}{4} \text{ kℓ} = \text{_____ } \ell$ (_)

b. A restaurant orders 100 ℓ of cooldrink for a big party.

i) How many 2 ℓ bottles will that be?

ii) How many $1\frac{1}{4} \ell$ bottles will that be?

iii) How many 400 mℓ glasses will that be? (_)

c. A bus uses 120 ℓ of diesel to complete its trip.





The bus does the same trip on 11 consecutive days. How many kilolitres of diesel will the bus have used? (_)

- Memo:** c. 8 ℓ 600 mℓ = 8,6 ℓ ; 250 mℓ ; 1,65 kℓ ; 2 750 ℓ
- d. 50 bottles ; 80 bottles ; 250 glasses
- e. 1320 ℓ = 1,32 kℓ

4.4 Time

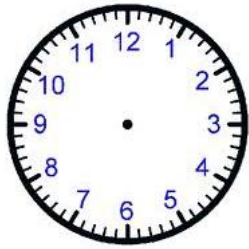
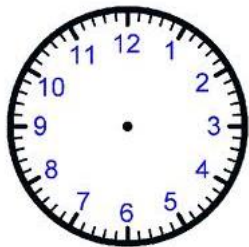
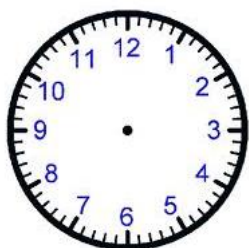
4.4.1 Reading time and time instruments

- 4.4.1(1) a. Fill in the times shown on the clocks below in words. The first one has been done for you.

	<p><i>Example:</i></p> <p><i>Half past nine</i></p>
	
	
	

()

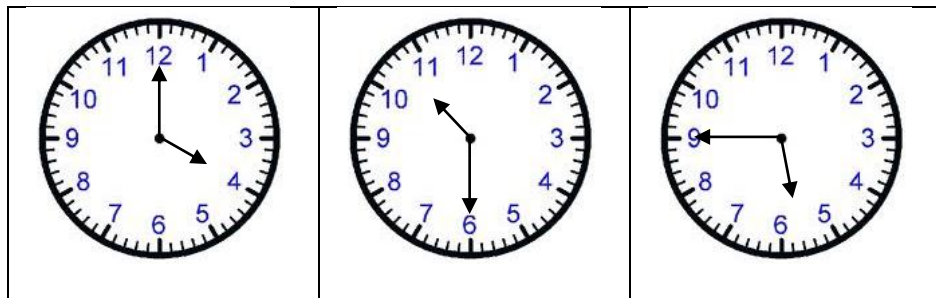
b. Fill in the hands on these clocks to show the following times.

Four o'clock	
Half past ten	
Quarter to six	

()

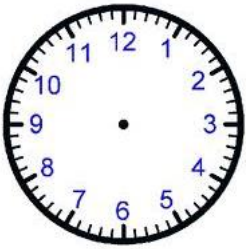
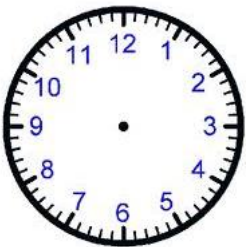
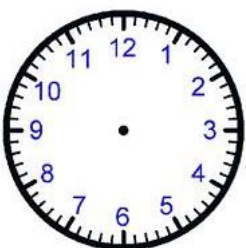
Memo: a. Five o'clock , Quarter to two , Quarter past seven

b.







4.4.1(2)

a. Fill in the hands on these clocks to show the following times.

07:30	
10.45 p.m.	
25 minutes past 5	

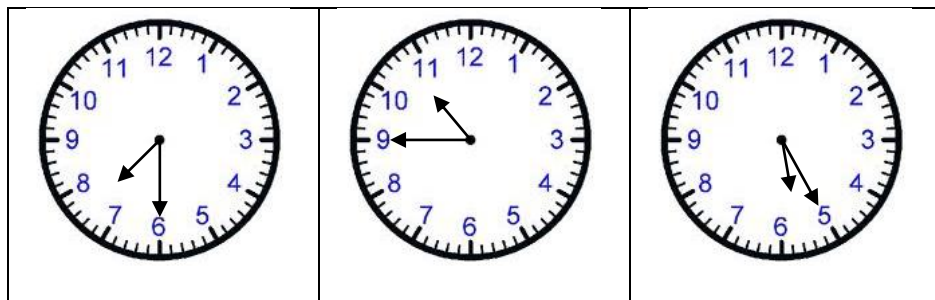
()

- b. Write the times of these analogue clocks in digital time. You do not need to say whether it is a.m. or p.m. The first one has been done for you.

	<i>Example:</i> 9:30
	
	
	

()

Memo: a.



- b. 5:15 , 1:20 , 6:55

4.4.1(3)

a. Write these times using the 24-hour cycle.


i) Quarter past seven in the morning

ii) 11.00 p.m.


iii) One o'clock in the afternoon

iv) Twenty to six in the evening


b. Write these times as digital times.



afternoon



morning



night

Memo:

a.	i)	07:15	ii)	23:00
	iii)	13:00	iv)	17:40
b.	14:20 , 11:05 , 21:50			

4.4.1(4)

a. Write the following 24-hour times as 12-hour times.

i) 16:45

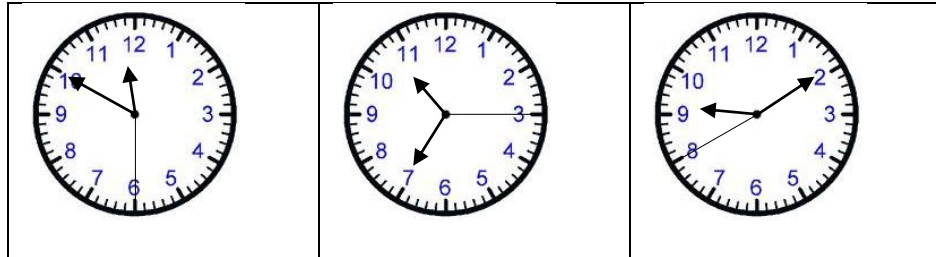
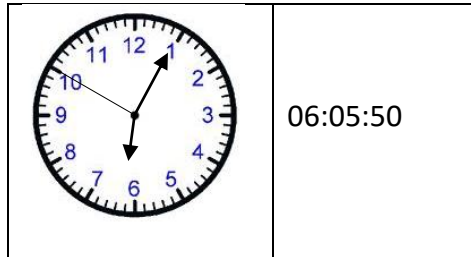
ii) 20:48

iii) 00:15

iv) 12:27

- b. Write these times as digital times. Include seconds hours, minutes and seconds.

For example:



()

Memo: a i) 4.45 p.m.

ii) 8:48 p.m.

iii) 12.15 a.m.

iv) 12.27 p.m.

b. 11:50:30

10:35:15

9:10:40

4.4.2 Reading calendars

4.4.2(1) Gerald uses his diary to organise his time.

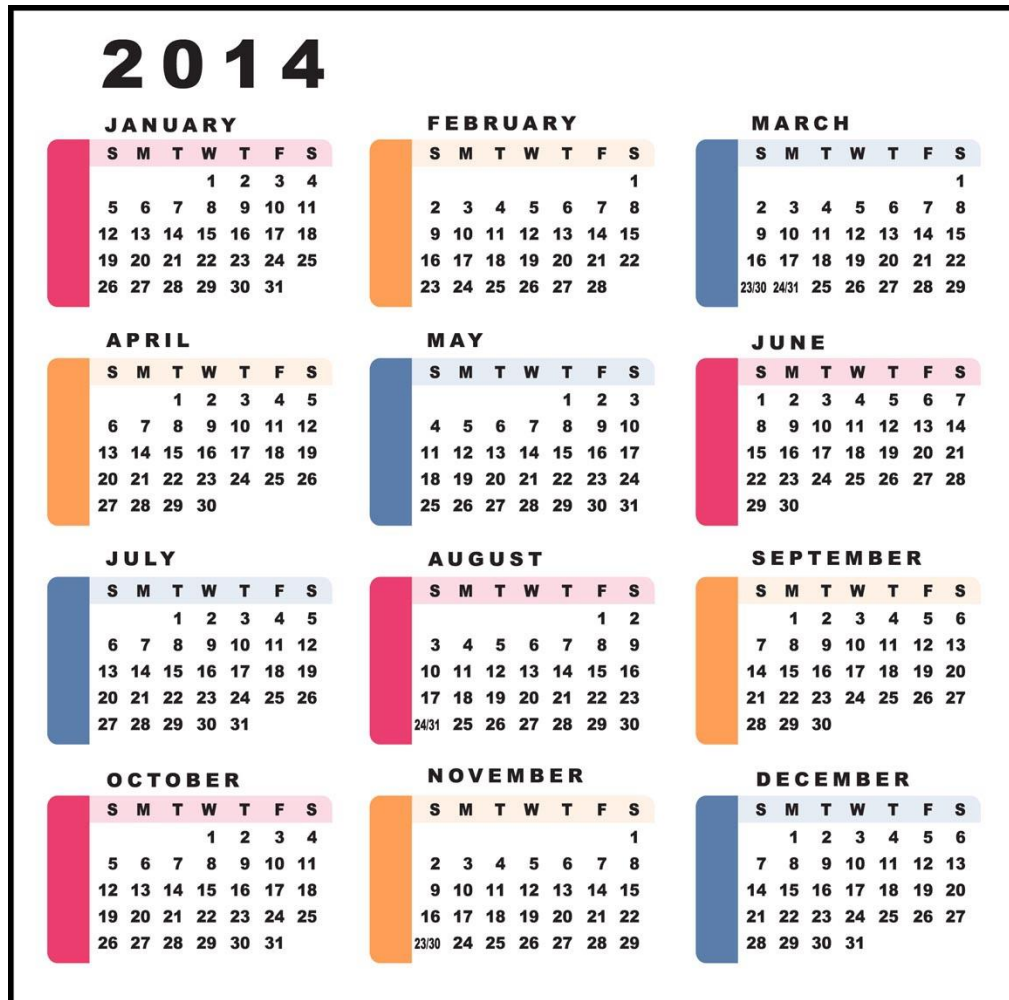
Monday Soccer 22 July	Monday Soccer 29 July
Tuesday Library Book due 23 July	Tuesday 30 July
Wednesday 24 July	Wednesday 31 July
Thursday Spelling test 25 July	Thursday Maths test 1 August
Friday 26 July	Friday John's Birthday Party 2 August
Saturday 27 July	Saturday 3 August
Sunday Visit Granny 28 July	Sunday 4 August

- What will Gerald do tomorrow? ()
- What did Gerald do last Sunday? ()
- What did Gerald need to pack for school last week Tuesday? ()
- John's birthday is 30 July. Write his birthday in Gerald's diary. ()
- How many days are there in July? ()
- Which month comes after August? ()

- Memo:**
- Go to John's birthday party.
 - He visited his granny.
 - His library book.

- d. Learners should write John's birthday in block labelled Tuesday 30 July.
- e. 31 days
- f. September

4.4.2(2) Look at the calendar.



- a. Name the fifth month. ()
- b. How many full weeks are there in June? ()
- c. How many weeks are there in the year? ()
- d. How many months are there in three years? ()
- e. Is this a leap year? Explain how you know. ()
- f. Heritage Day is celebrated on 24 September every year. Circle the 24 September on the calendar. What day of the week is it on? ()

- Memo:**
- a. May
 - b. 4 weeks
 - c. 52 weeks
 - d. 36 months
 - e. No. There are 28 days in February.
 - f. *Learners should circle 24 September.*
- It is on Wednesday

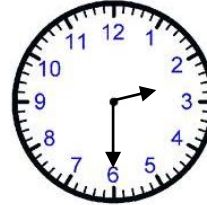
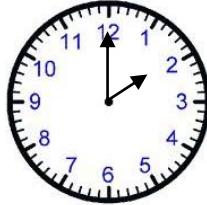
There is no further progression in Reading calendars.

4.4.3 Calculations and problem solving

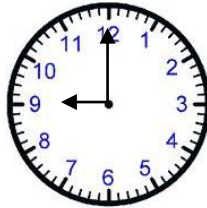
4.4.3(1) a. What is the difference in time between the times shown on these clocks?

They all represent times in the morning.

i)



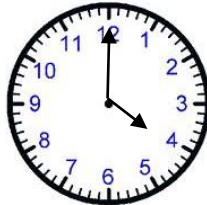
ii)



iii)



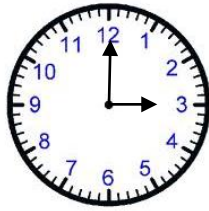
iv)



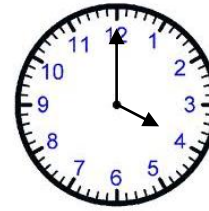
()

b. For each of the following, say how long the activity took.

i)



Went for a walk.

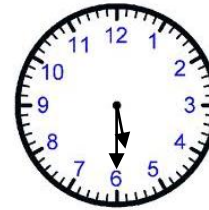


Arrived back from walk.

ii)



Started homework.

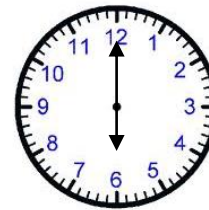


Completed homework.

iii)



Programme started on TV



Programme ended on TV.

()

Memo: a. i) Half an hour

iii) 3 hours

b. i) One hour

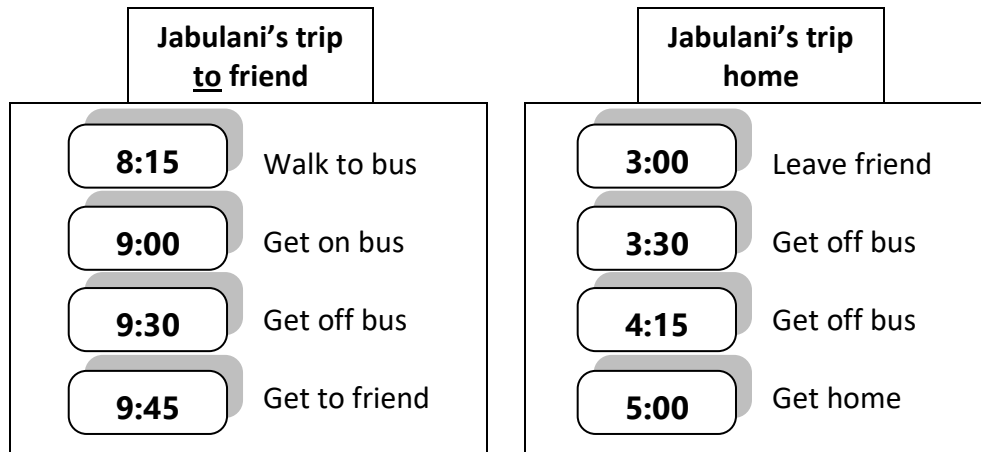
iii) Half an hour

ii) 1 and a half hour

iv) 7 and a half hours

ii) One and a half hour

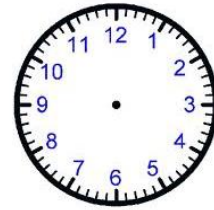
4.4.3(2) a. Jabulani visits his friend.



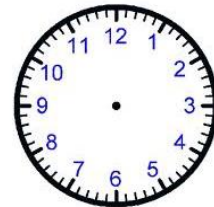
- i) How long was the bus trip to Jabulani's friend's house?
 - ii) How much longer was the bus trip on his return home?
 - iii) How long did it take Jabulani to walk to his friend's house after he got off the bus?
 - iv) On his return, did he walk faster or slower to the bus stop from his friend's house? How much faster or slower did he walk?
 - v) How long did he take to get to his friend's house?
 - vi) How long did he take returning from his friend's house? ()
- b. My friends are going to visit their family for 21 days. How many weeks is that? ()

c. What time do these activities end? Write in the answer by filling in the hands on the clocks.

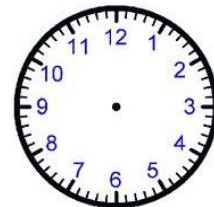
- i) I start getting ready for school at 7.15 a.m. I was ready for school half an hour later.



- ii) Father and I started making a fire at 8.30 a.m. We were finished a quarter of an hour later.



- iii) It is 10.45 a.m. I must meet my friends in two and a quarter hours.

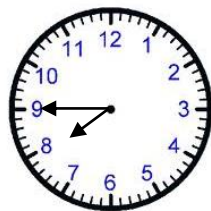


()

- Memo:** a. i) half an hour ii) quarter of an hour
 iii) quarter of an hour iv) Slower - quarter of an hour
 v) one and a half hours vi) 2 hours

b. 3 weeks

i)



ii)



iii)



4.4.3(3) a. A movie starts on TV at 4:30 and ends at 5: 55. How many minutes long is it?

()

b. Zoey was born in 1997.

- i) How old was she in 2012?
 ii) How old will she be in 2030?
 iii) In which year will she turn 40 years old?

()

c. Janet goes to bed at 8.50 p.m. and gets up at 06:20.

i) How many hours and minutes was she in bed?

ii) How many minutes was she in bed?

()

Memo: a. 1 hour and 25 minutes.

b. i) 15 years old

ii) 33 years old

iii) 2037

c. i) 9 hrs 30 minutes

ii) 570 minutes

4.4.3(4) a. Grandfather was born in 1944.

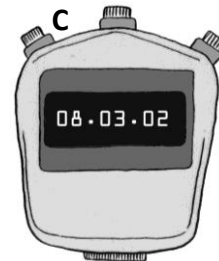
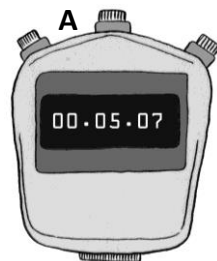
i) In which year did he turn 40 years old?

ii) How old does he turn in 2013?

iii) In which year will he turn 80 years old?

()

b. Look at the following stopwatches. Match the time with the appropriate activity.



i) Walk 6 kilometres

ii) Shower

iii) Beginning of first lesson until first break

iv) Healthy length of time to sleep every night

v) Run 100 metres

()

- c. The school organises a netball tournament. The tournament starts at 09:00 and ends at 17:00. They play one game every $1\frac{1}{2}$ hours. How many games can they play?

()

- d. Fill in the missing times on this bus time table.

Departure time	Duration of journey	Arrival time
8.15 a.m.	2 hours 15 minutes	
8.50 a.m.	1 hour 50 minutes	
10.05 a.m.	2 hours 20 minutes	
11.35 a.m.		2.15 p.m.
12.30 p.m.		3.25 p.m.
	4 hours 20 minutes	3.10 p.m.
	2 hours 10 minutes	1.10 a.m.

()

- Memo:** a. i) 1984 ii) 69 years old iii) 2024
b. i) B ii) A iii) E
iv) C v) D

- c. 5 matches

- d.

Departure time	Duration of journey	Arrival time
8.15 a.m.	2 hours 15 minutes	10.30 a.m.
8:50 a.m.	1 hour 50 minutes	10:40 a.m.
10:05 a.m.	2 hours 20 minutes	12:25 p.m.
11:35 a.m.	2 hours 40 minutes	2:15 p.m.
12:30 p.m.	2 hours 55 minutes	3:25 p.m.
10:50 a.m.	4 hours 20 minutes	3:10 p.m.
11:00 a.m.	2 hours 10 minutes	1:10 a.m.

- 4.4.3(5)
- a. Themba starts school at 07:45. He takes 15 minutes to get dressed, 20 minutes to eat and 30 minutes to walk to school. What is the latest time that he should get up and not be late for school? ()
- b. Complete.
- i) 460 years = _____ centuries and _____ decades
- ii) 2 000 years = _____ centuries
- iii) 30 centuries = _____ years
- iv) 1 millennium + 5 centuries + 7 decades = _____ years
- v) 420 years = _____ decades ()
- c. The first 3 songs on a CD play for 3:11, 2:35 and 1:26 minutes. How long will it take to listen to all three songs? ()
- d. Sindi can hold her breath for 2 minutes and 35 seconds. Amos can hold his breath for 1 minute and 56 seconds. How much longer can Sindi hold her breath than Amos? ()

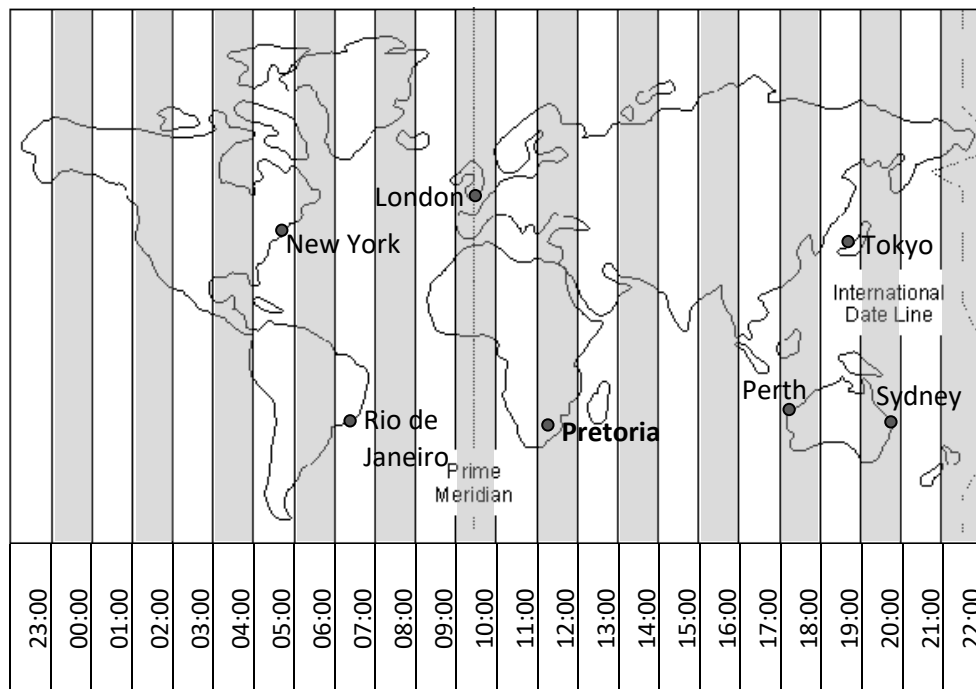
- e. The bus from Cape Town to Bloemfontein makes several stops. The table below gives the time that the bus arrives at each stop. It leaves Cape Town at 10:15.

Cape Town	10:15
Bellville	10:45
Paarl	11:10
Worcester	11:55
Touws River	12:45
Matjiesfontein	13:30
Laingsburg	14:15
Prince Albert Road	15:05
Leeu-Gamka	15:55
Beaufort West	16:20
Tree Sisters	17:25
Richmond	18:15
Hanover	19:00
Colesberg	19:55
Bloemfontein	22:35

- i) How long does it take from:
1. Cape Town to Touws River?
 2. Beaufort West to Bloemfontein?
 3. Prince Albert Road to Hanover?
- ii) How long does the whole journey take?
- iii) Between which two towns would you be half way through the journey?

()

- f. The map below shows the International Time Zones when it is 12:00 in Pretoria.



- i) What is the time in the following places when it is midday (12:00) in Pretoria? Write your answer as a 24-hour time.

1. London
2. New York
3. Perth
4. Rio de Janeiro
5. Tokyo

- ii) How many hours is Sydney ahead of Pretoria?

- iii) How many hours is New York behind Pretoria?

()

Memo: a. 06:40 or 6:40 a.m.

b. i) 460 years = **4** centuries and **6** decades

ii) 2 000 years = **20** centuries

iii) 30 centuries = **3 000** years

iv) 1 millennium + 5 centuries + 7 decades = **1 570** years

v) 420 years = **42** decades

c. 07:12 or 7 minutes, 12 seconds.

d. 39 seconds

i) 1. 2 hrs 30 mins 2. 6 hrs 15 mins 3. 3 hrs 55 mins

ii) 12 hrs 20 mins

ii) Half way between Beaufort West and Three Sisters

f. i) 1. 10:00 2. 05:00

3. 18:00

4. 07:00

5. 19:00

ii) 8 hours

iii) 7 hours

- 4.4.3(6) a. The table below gives the times that the bus stops on a trip from Smith Street to Sports Centre.

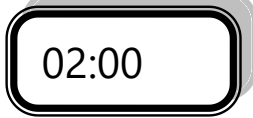
Smith Street	09:15	09:30	09:45	10:00	10:15	10:30
City Hall	09:19	09:34	09:49	10:04	10:19	10:34
Brixton Street	09:30	09:45	10:00	10:15	10:30	10:45
Long Street	09:34	09:49	10:04	10:19	10:34	10:49
Sports Centre	09:55	10:10	10:25	10:40	10:55	11:10

- i) How long is the trip from Brixton Street to Sports Centre?
- ii) How long would you expect to wait if you arrived at the Long Street stop at 10:06?
- iii) What time will the 09:45 bus arrive back at Smith Street, if the trip takes the same amount of time each way and the bus stops for 15 minutes at the Sports Centre?

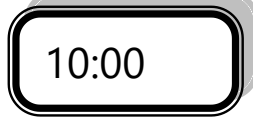
()

- b. The five clocks below show the time at different places in the world at the same moment.

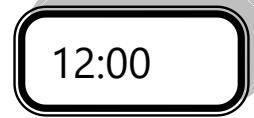
San Francisco



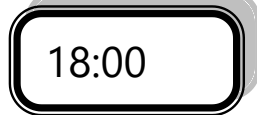
London



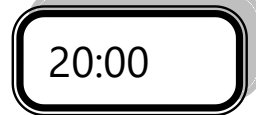
Cape Town



Beijing



Sydney



- i) Fill in the missing times in the table:

San Francisco	London	Cape Town	Beijing	Sydney
		10.00 a.m.		
	12.00 p.m.			
				11.00 p.m.

- ii) What is the time difference between:

1. London and Sydney?
2. Beijing and San Francisco?
3. Cape Town and San Francisco?

()

Memo: a. i) 25 min ii) 5 min iii) 11:20

b. i)

San Francisco	London	Cape Town	Beijing	Sydney
12 a.m.	8 a.m.	10.00 a.m.	4 p.m.	6 p.m.
4 a.m.	12.00 p.m.	2 p.m.	8 p.m.	10 p.m.
5 a.m.	1 p.m.	3 p.m.	9 p.m.	11.00 p.m.

ii) 1. 10 hrs 2. 16 hrs 3. 10hrs

4.4.4 History of time

4.5 Temperature

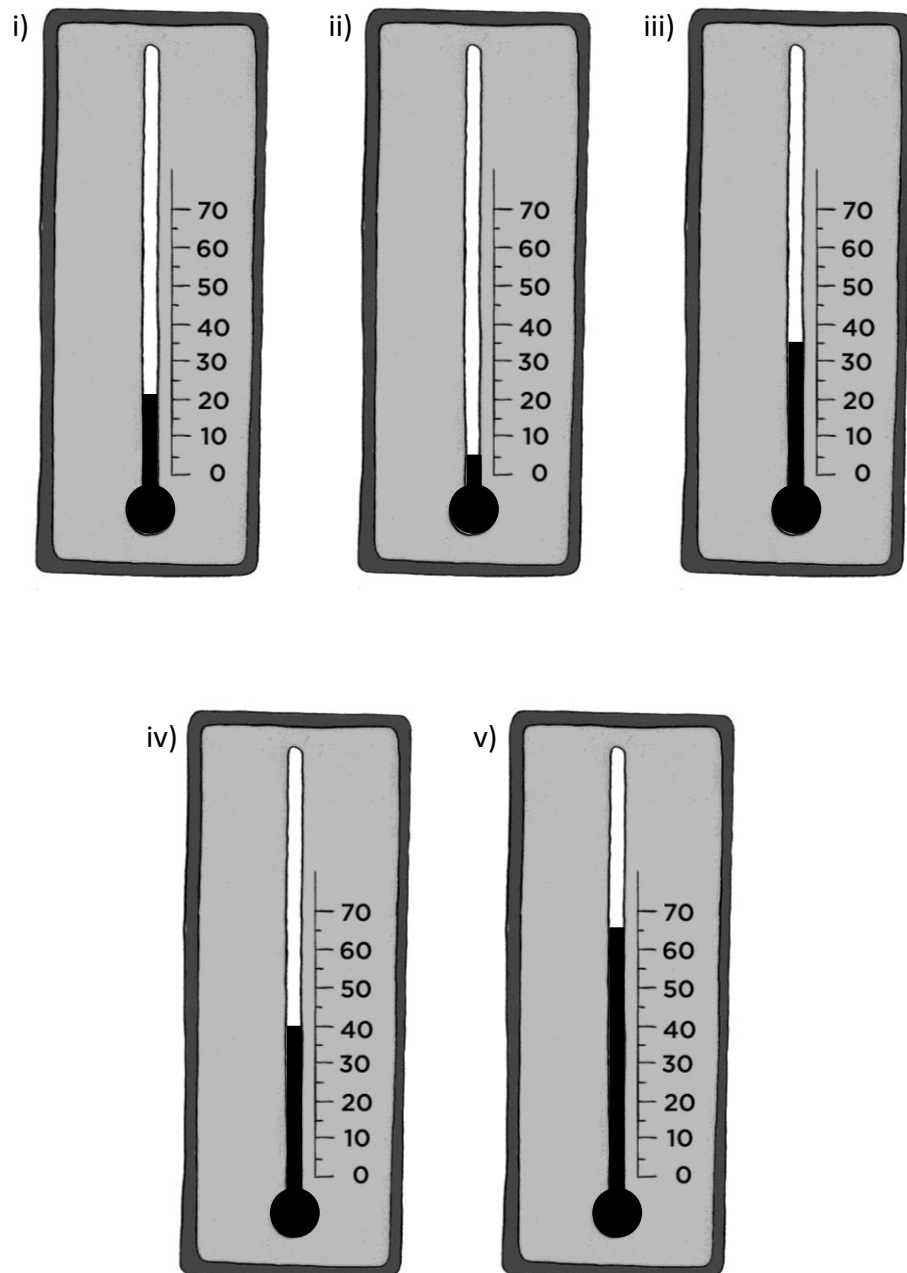
4.5.1 Practical measuring - PRACTICAL

4.5.2 Measuring instruments

4.5.3 Units

4.5.2(4) a. Write down the temperature shown on each thermometer.

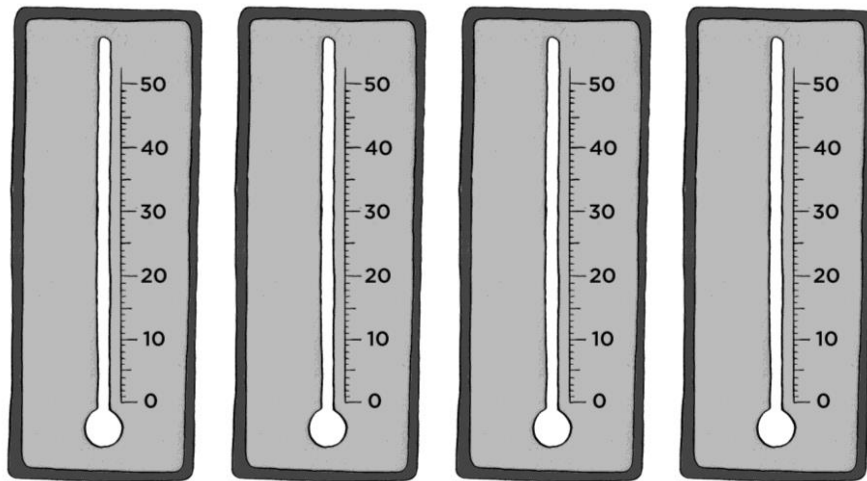
4.5.3(4)



- b. The following list shows the temperatures of a town in the Western Cape for a week in May.

Monday	19°C
Tuesday	21°C
Wednesday	24°C
Thursday	18°C
Friday	14°C
Saturday	15°C
Sunday	16°C

Label these temperatures on each thermometer:

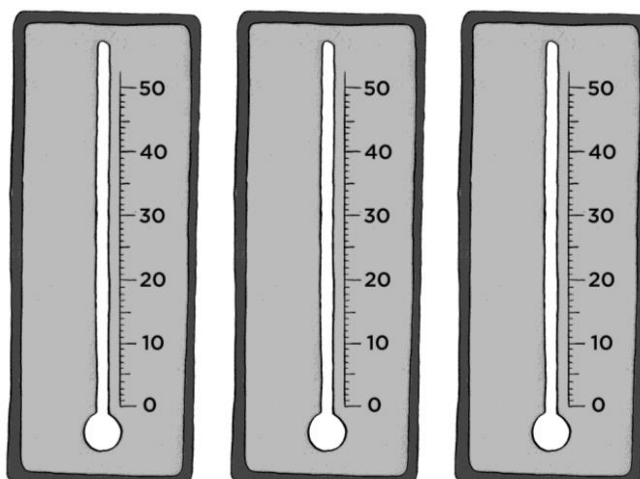


Monday

Tuesday

Wednesday

Thursday



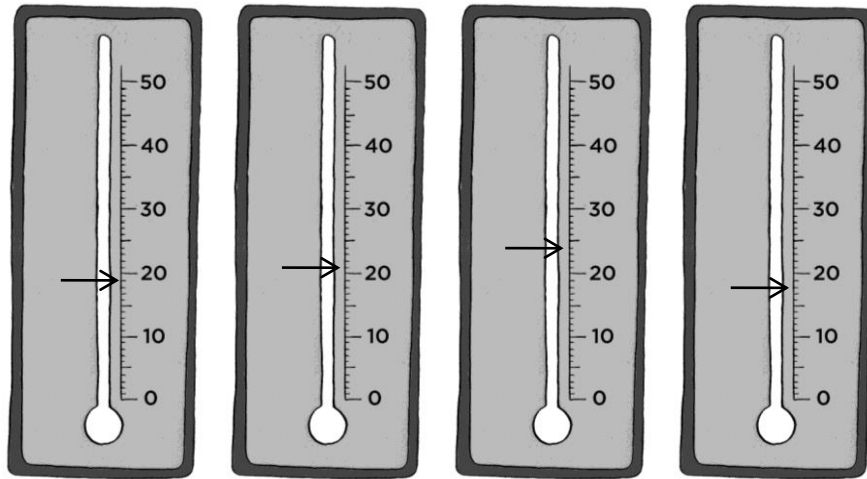
Friday

Saturday

Sunday

Memo: a. A: 20°C ; B: 5°C ; C: 35°C ; D: 40°C ; E: 65°C

b.

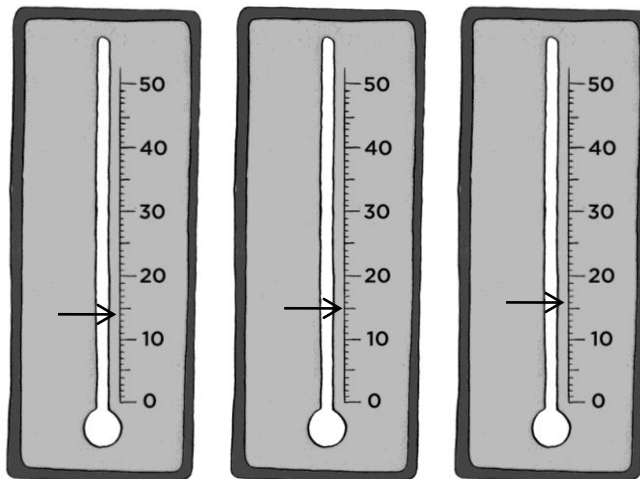


Monday

Tuesday

Wednesday

Thursday



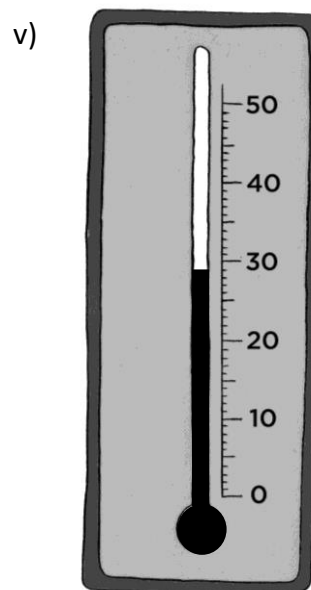
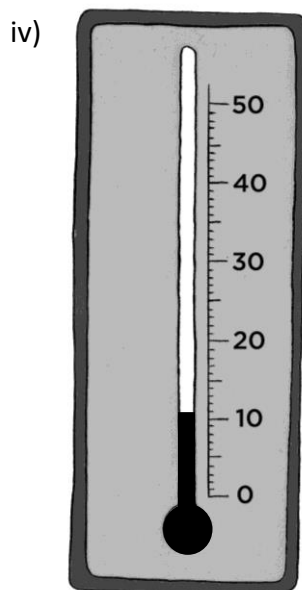
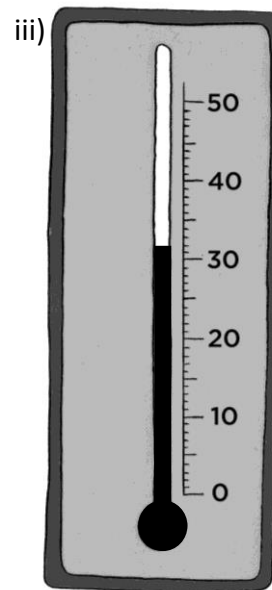
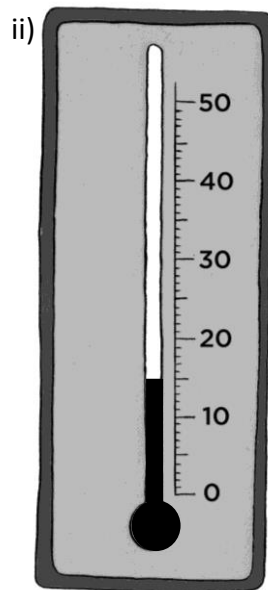
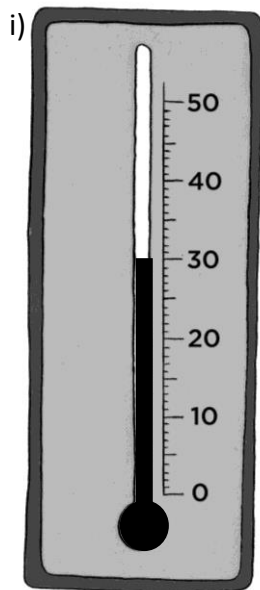
Friday

Saturday

Sunday

4.5.2(5)

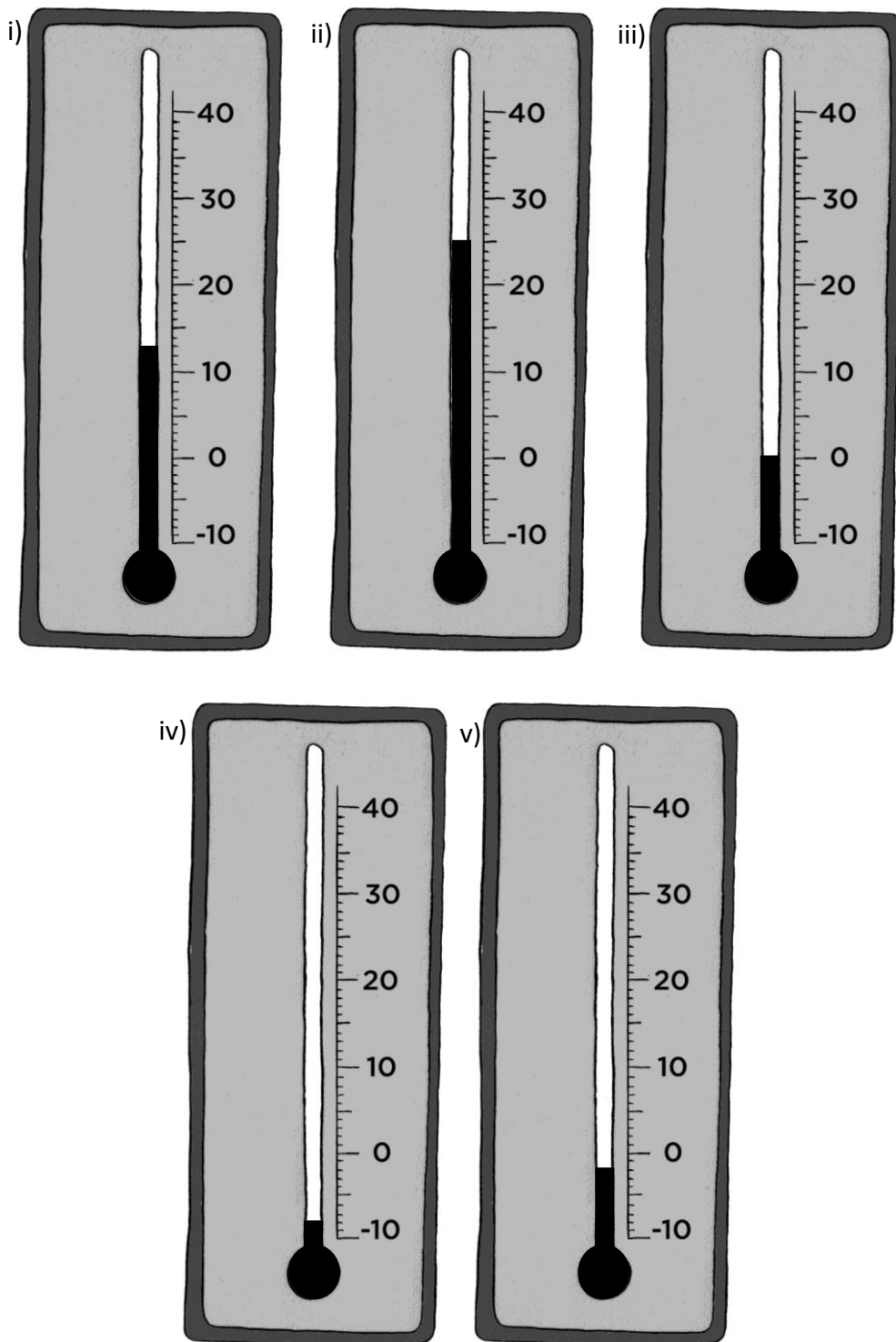
Write down the temperature shown on each thermometer.



Memo: i) 30°C ii) 15°C iii) 32°C iv) 11°C v) 29°C

4.5.2(6)

Write down the temperature shown on each thermometer.



Memo: i) 13°C ii) 25°C iii) 0°C iv) -8°C v) -2°C

4.5.4 Calculations and problem-solving involving temperature

4.5.4(4) The following table gives the noon/day and night temperatures of various towns in the Western Cape on 5 May.

Town	Day Temperature °C	Night Temperature °C
Cape Town	20°C	14°C
Ceres	19°C	9°C
Worcester	22°C	8°C
Caledon	20°C	11°C
Vredendal	25°C	13°C
George	20°C	10°C

- Which town is the coldest during the day on 5 May?
- Which town is the coldest at night on 5 May?
- Which town is the warmest at noon on 5 May?
- Which town is the warmest at night on 5 May?
- What is the difference between the day and night temperature at Vredendal?
- Which town has the biggest difference between its noon and night temperature?

()

- Memo**
- Ceres
 - Worcester
 - Vredendal
 - Cape Town
 - 12°C ;
 - Worcester

4.5.4(5) The list shows the temperature in different world cities on a particular day.

Barbados	27°C
Auckland	20°C
Bangkok	32°C
London	9°C
Jakarta	31°C
Paris	11°C
Moscow	0°C
Darwin	40°C
Tokyo	14°C
Cape Town	23°C

- i) Calculate the difference in the temperatures between Cape Town and London.
- ii) Which is the coldest city on that day?
- iii) Which is the warmest city on that day? ()

- Memo**
- i) 14°C
 - ii) Moscow
 - iii) Darwin

4.5.4(6) a.

0°C	3°C	7°C	14°C	30°C	37°C	40°C	72°C	100°C
-----	-----	-----	------	------	------	------	------	-------

Say which temperatures is the most appropriate for each:

- i) A cold day.
- ii) Freezing temperature
- iii) Refrigerator temperature
- iv) A very hot day.
- v) A healthy body temperature ()

b. The temperature in Cape Town on a particular day was 22°C.

What was the temperature in the following places on this day, if:

i) London was 14°C colder?

ii) Darwin was 12°C warmer?

iii) Greenland was 24°C colder?

Memo: a. i) 7°C

ii) 0°C

iii) 3°C

iv) 40°C

v) 37°C

b. i) London 8°C

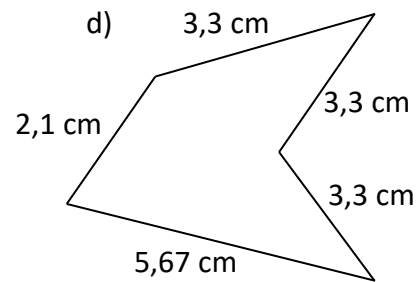
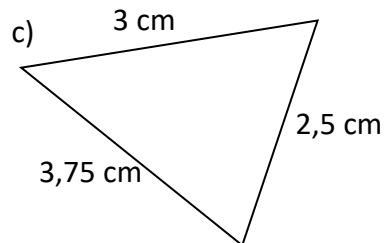
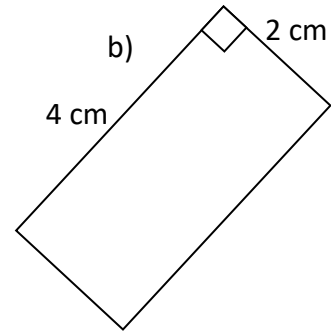
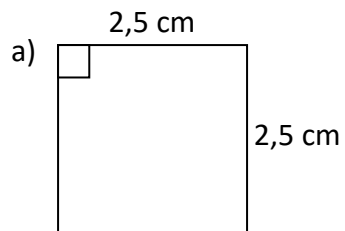
ii) Darwin 34°C

iii) Greenland -2°C

4.6 Perimeter, surface area and volume

4.6.1 Perimeter – PRACTICAL in Grades 4 - 6

4.6.1(6) Calculate the perimeter of the following shapes.

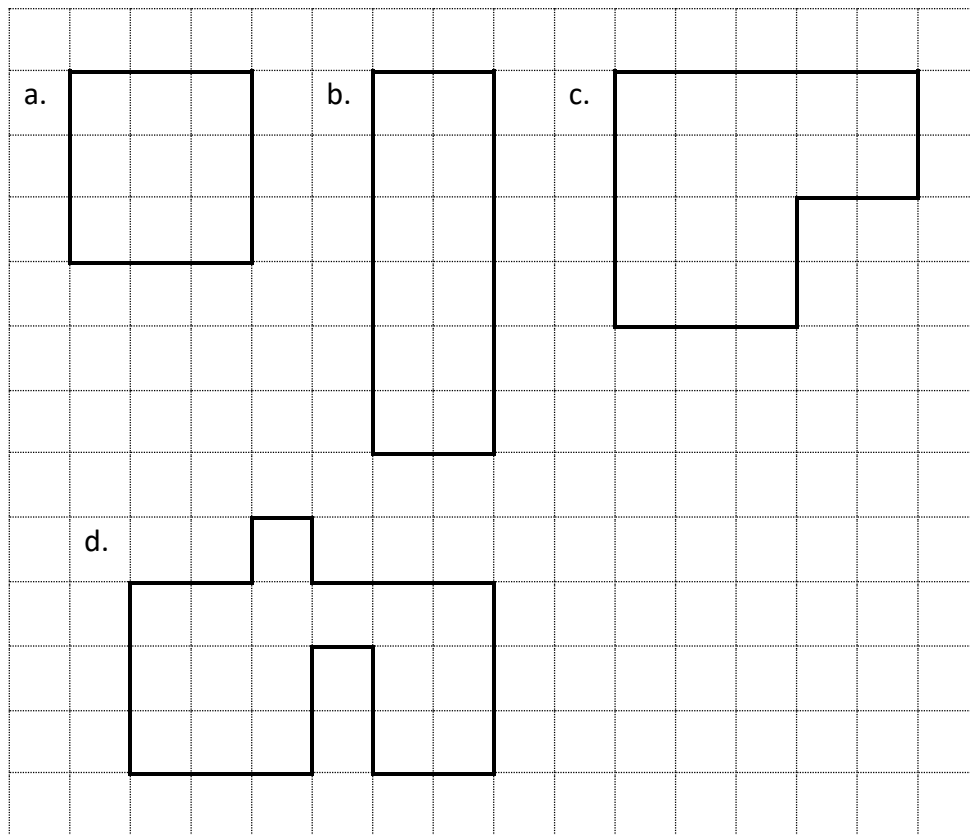


()

Memo: a) 10 cm b) 12 cm c) 9,25 cm d) 17,67 cm

4.6.2 Measuring area

4.6.2(3) Count the number of squares in each shape.



()

Memo a. 9 squares

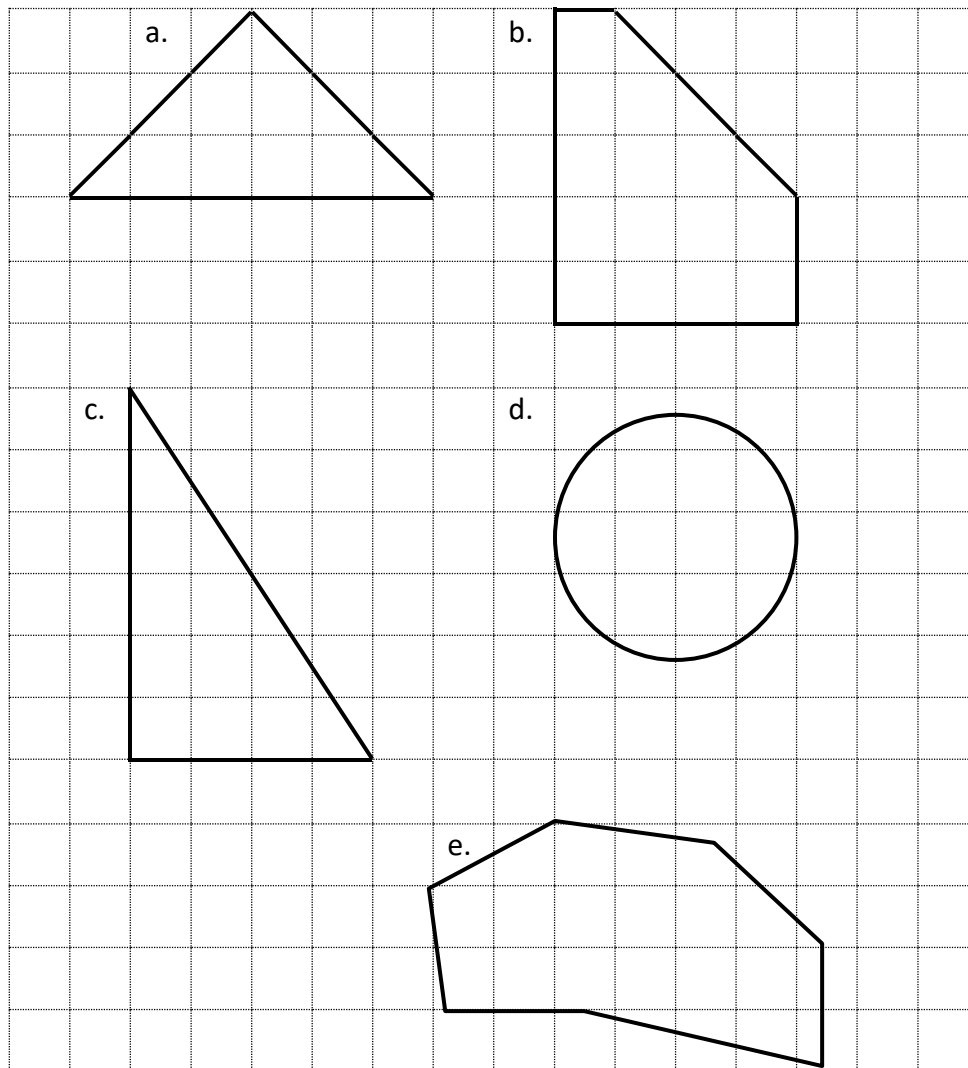
b. 12 squares

c. 16 squares

d. 17 squares

4.6.2(4)

Estimate the area of each shape by counting the number of square units each covers.



Memo: a. 9 square units

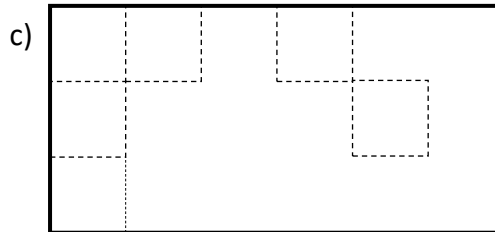
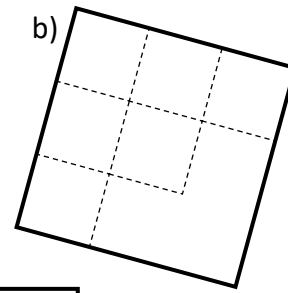
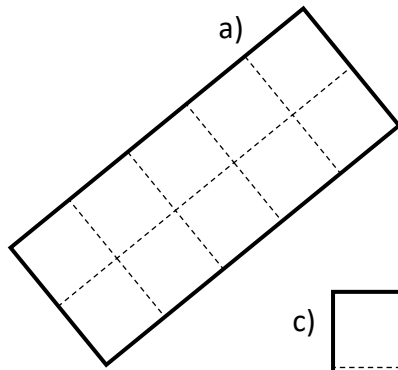
b. 15,5 or $15\frac{1}{2}$ square units

c. 12 square units

d. $\approx 12,5$ square units.
Accept 11 – 14 square units

e. ≈ 18 square units.
Accept 16 – 20 square units

4.6.2(5) Calculate the area of each rectangle in square units.

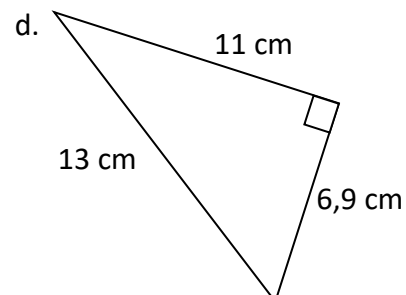
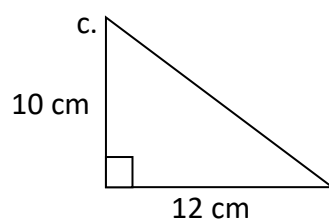
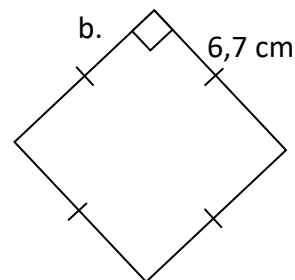
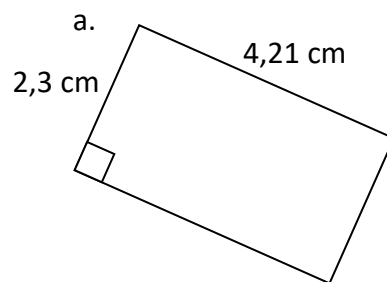


Memo: a. 10 square units b. 9 square units c. 18 square units

4.6.2(6) Calculate the area of the following shapes, correct to one decimal place.

You may use these formulae:

Area of rectangle = length \times width
Area of square = side \times side
Area of triangle = $\frac{1}{2} \times$ base \times perpendicular height



Memo: a. $9,683 \text{ cm}^2 \approx 9,7$

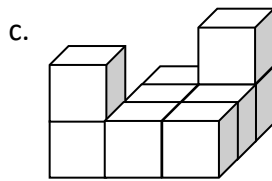
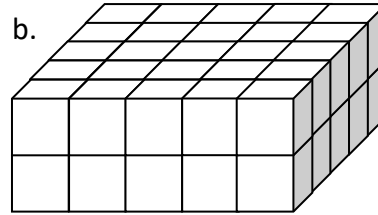
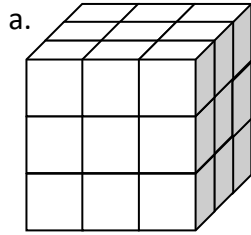
b. $44,89 \text{ cm}^2 \approx 44,9 \text{ cm}^2$

c. 60 cm^2

d. $37,95 \text{ cm}^2 \approx 38,0 \text{ cm}^2$

4.6.3 Measurement of volume – PRACTICAL

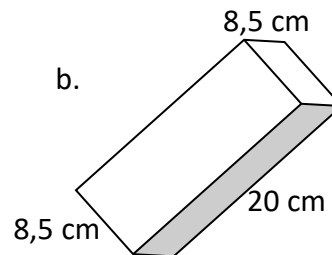
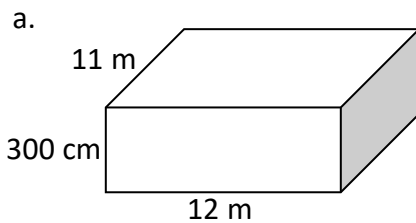
4.6.3(5) Find the volume of the following objects by counting the cubic units.



Memo: a. 27 cubic units b. 50 cubic units c. 9 cubic units

4.6.3(6) Find the volume of the following rectangular prisms, correct to one decimal place. You may use the formula:

Volume of rectangular prism = length \times width \times height



Memo: a. 396 m³ b. 1 445 cm³

4.6.4 Investigate – ASSESSED BY INVESTIGATION

4.7 History of measurement

4.7.1 History of measurement - ASSESSED BY PROJECT

5. DATA HANDLING

5.1 Collecting and Organising Data

- 5.1(2) A teacher collects the following information on the favourite sport of each learner in her class:

Learner	Favourite Sport
Andile	Hockey
Sipho	Soccer
Emma	Netball
Jason	Soccer
Nomkhosi	Athletics
Jeremiah	Soccer
Alison	Netball
Izzy	Hockey
Clement	Soccer
Kate	Netball
Anele	Soccer
Joshua	Cricket
Senzo	Rugby
Mpho	Athletics
Cindi	Netball
Mthandeni	Cricket
Kashief	Cricket
Ajay	Soccer
Precious	Hockey

- How many learners are there in this class? ()
- Write down all of the different sports chosen by the learners. ()
- Write down separate lists to show the names of the learners doing each of the different sports. ()

- d. Use tallies to count how many learners chose each sport. The first row has been completed for you.

Sport	Tally	How many?
Athletics		2

()

- e. Why do you think it is important to be able to organise information?

()

Memo: a. 19 learners

- b. Athletics; Cricket; Hockey; Netball; Rugby and Soccer

c.

Learner	Favourite Sport
Nomkhosi	Athletics
Mpho	Athletics

Learner	Favourite Sport
Joshua	Cricket
Mthandeni	Cricket
Kashief	Cricket

Learner	Favourite Sport
Andile	Hockey
Izzy	Hockey
Precious	Hockey

Learner	Favourite Sport
Emma	Netball
Alison	Netball
Kate	Netball
Cindi	Netball

Learner	Favourite Sport
Senzo	Rugby

Learner	Favourite Sport
Sipho	Soccer
Jason	Soccer
Jeremiah	Soccer
Clement	Soccer
Anele	Soccer
Ajay	Soccer

d.

Sports Choice	Tally	How Many?
Athletics		2
Cricket		3
Hockey		3
Netball		4
Rugby		1
Soccer		6

e. Organising data makes it easier to make sense of what is happening in the data.

5.1(3) A learner collects the following data:

The learner completes the table as follows:

Male or Female	Approximate age (Young, Middle Age, Old)
F	Middle
F	Old
M	Middle
F	Old
F	Old
M	Old
M	Old
F	Middle
F	Old
F	Middle
M	Old
M	Old
F	Old
M	Old
F	Young
M	Young
F	Old

b. How many people has the learner recorded information about? ()

c. How many people were males and how many were females? ()

d. Organise the information on gender in this frequency table.

Gender	Tally	Number of people
Female		
Male		

()

- e. Organise the information on age in this frequency table.

Age	Tally	Number of people
Young		
Middle		
Old		

()

- f. If this information is about shoppers visiting a particular shop, explain why the shop owner might want to collect and know this information.

()

Memo: a. 17 people

- b. 7 males and 10 females

c.

Gender	Tally	Number of people
Female		10
Male		7

d.

Age	Tally	Number of people
Young		2
Middle		4
Old		11

- e. The shop owner can use the information to know what types of things to sell based on the types of people visiting his store. For example, if mainly females visit the store then he should sell things that females like.

5.1(4) Look at this table showing data about people visiting a shop.

Male or Female	Approximate age (Young, Middle Age, Old)
F	Middle
F	Old
M	Middle
F	Old
F	Middle
M	Middle
M	Old
F	Middle
F	Middle
F	Middle
M	Old
M	Middle
F	Old
M	Old
F	Young
M	Young
F	Old

- Redraw the table and organise the data so that the information on females is at the top and the information on males is at the bottom. ()
- Why is it useful to reorganise the table like this? ()
- Draw the table again. This time organise the data so that the information on the Young people is grouped together, the information on the Middle-aged people is grouped together and the information on the Old people is grouped together. ()
- What does this grouped data tell us about the type of the shoppers that like to shop at this supermarket? ()
- How could a shop manager use this data to help you to run your shop? ()

Memo: a.

Male or Female	Approximate age (Young, Middle Age, Old)
F	Middle
F	Old
F	Old
F	Middle
F	Middle
F	Middle
F	Middle
F	Old
F	Young
F	Old
M	Middle
M	Middle
M	Old
M	Old
M	Middle
M	Old
M	Young

- b. It is easier to look at the information about female shoppers only and male shoppers only and compare them.

c.

Male or Female	Approximate age (Young, Middle Age, Old)
F	Young
M	Young
F	Middle
F	Middle
F	Middle
F	Middle
F	Middle
M	Middle
M	Middle
M	Middle
F	Old
F	Old
F	Old
F	Old
M	Old
M	Old
M	Old

- d. There are slightly more female shoppers than male shoppers. And most of the shoppers are 'old'.
- e. Because most of the shoppers are old, the manager should plan for things like wheel chair ramps, places to sit and rest, and possibly offer tea and cake. Also, the manager might decide to sell more products that suit these older shoppers or to give discounts for older shoppers.

There are also more female shoppers than male shoppers, so the manager might want to sell products that female shoppers might prefer (such as beauty products, or make-up).

5.1(5) The table show marks for a test that was out of 10 marks.

Name	Mark
Alan	2
Anna	10
Botshiwe	8
Busisiwe	10
Claire	8
Clement	3
Hermoine	9
Joseph	4
Joseph	6
Karen	10
Kashief	4
Kelly	8
Khosi	7
Marc	4
Mohammed	5
Mthandeni	7
Nazneem	8
Sipho	3
Viren	6
Zinhle	8

- a. How many learners are there in this class? ()
- b. The teacher has arranged this data alphabetically. Why do you think she has done this? ()
- c. Write the information in the table from the lowest mark to the highest mark. ()

- d. Why is it useful to arrange the data from the lowest mark to the highest mark? ()

- e. Organise the test marks in this frequency table:

Mark	Tally	Number of learners with this mark
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		

- f. Do you think the learners have done well in this test? Use the frequency table to explain your answer. ()

Memo: a. 20 learners.

- b. Since the names are in alphabetical order, it is easy for the teacher to quickly find the name of any learner and their mark.

c.

Name	Mark	Name	Mark
Alan	2	Mthandeni	7
Clement	3	Botshiwe	8
Sipho	3	Claire	8
Joseph	4	Kelly	8
Kashief	4	Nazneem	8
Marc	4	Zinhle	8
Mohammed	5	Hermoine	9
Joseph	6	Anna	10
Viren	6	Busisiwe	10
Khosi	7	Karen	10

- d. It is easier to see what the lowest and highest marks are, and also to see whether more learners scored high or low marks or marks near the middle.

e.

Mark	Tally	Number of learners with this mark
1	---	
2		1
3		2
4		3
5		1
6		2
7		2
8	++++	5
9		1
10		3

- f. Most of the learners achieved 6, 7, 8, 9 or 10 for the test. And since these are good marks, the teacher might be pleased with the performance of most of the learners.

5.1(6) The table shows marks for a test out of 10 marks.

Name	Boy or Girl	Mark
Alan	B	2
Anna	G	10
Botshiwe	G	8
Busisiwe	G	10
Claire	G	8
Clement	B	3
Hermoine	G	9
Joseph	B	4
Joseph	B	6
Karen	G	10
Kashief	B	4
Kelly	G	8
Khosi	G	7
Marc	B	4
Mohammed	B	5
Mthandeni	B	7
Nazneem	G	8
Sipho	B	3
Viren	B	6
Zinhle	G	8

- a. How many learners in the class are boys? ()
- b. How many learners got 8 marks for the test? ()

- c. How many boys got 4 marks for the test? ()
- d. How many girls got 5 marks for the test? ()

- e. Redraw the table and organise the data so that all of the information about boys is at the top and their marks are arranged from lowest to highest.

Do the same for the marks for the girls in the bottom of the table. ()

- f. Use the data to complete the frequency table below:

	Boys		Girls	
Mark	Tally	Frequency	Tally	Frequency
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				

- g. Did the boys or the girls do better in the test? Explain your answer using the information in the frequency table. ()

Memo: a. 10 boys

b. 5 learners

c. 3 boys

d. No girls

e.

Name	Boy or Girl	Mark
Alan	B	2
Clement	B	3
Sipho	B	3
Joseph	B	4
Kashief	B	4
Marc	B	4
Mohammed	B	5
Joseph	B	6
Viren	B	6
Mthandeni	B	7
Khosi	G	7
Botshiwe	G	8
Claire	G	8
Kelly	G	8
Nazneem	G	8
Zinhle	G	8
Hermoine	G	9
Anna	G	10
Busisiwe	G	10
Karen	G	10

f.

Mark	Boys		Girls	
	Tally	Frequency	Tally	Frequency
1	---	0	---	0
2		1	---	0
3		2	---	0
4		3	---	0
5		1	---	0
6		2	---	0
7		1		1
8	---	0		5
9	---	0		1
10	---	0		3



- g. The girls did much better than the boys. We can say this because most of the girls got 7 marks or more, but only one boy got 7 marks and the rest got less than 7 marks.

5.2 Representing Data

5.2(1) The children in a class are asked what sports they would like to do.

- 4 children want to do athletics,
- 2 Children want to cycle,
- 10 children want to play hockey,
- 1 child wants to do horse-riding,
- 14 children want to play netball,
- 3 children want to play rugby,
- 12 children want to play soccer, and
- 3 children want to play tennis

a. Complete this pictograph to show this data.

Sports Choice	Number of Children
Athletics	
Cycling	
Cricket	
Hockey	
Horse-riding	
Netball	
Rugby	
Soccer	
Tennis	










()

b. What is the most popular sport in this class?

()

- c. What is the least popular sport in this class? ()
- d. Should the school offer horse riding? Use the pictograph to explain your answer. ()
- e. Why do you think a pictograph is a useful way of showing data? ()

Memo: a. *The size of the children should be equal.*

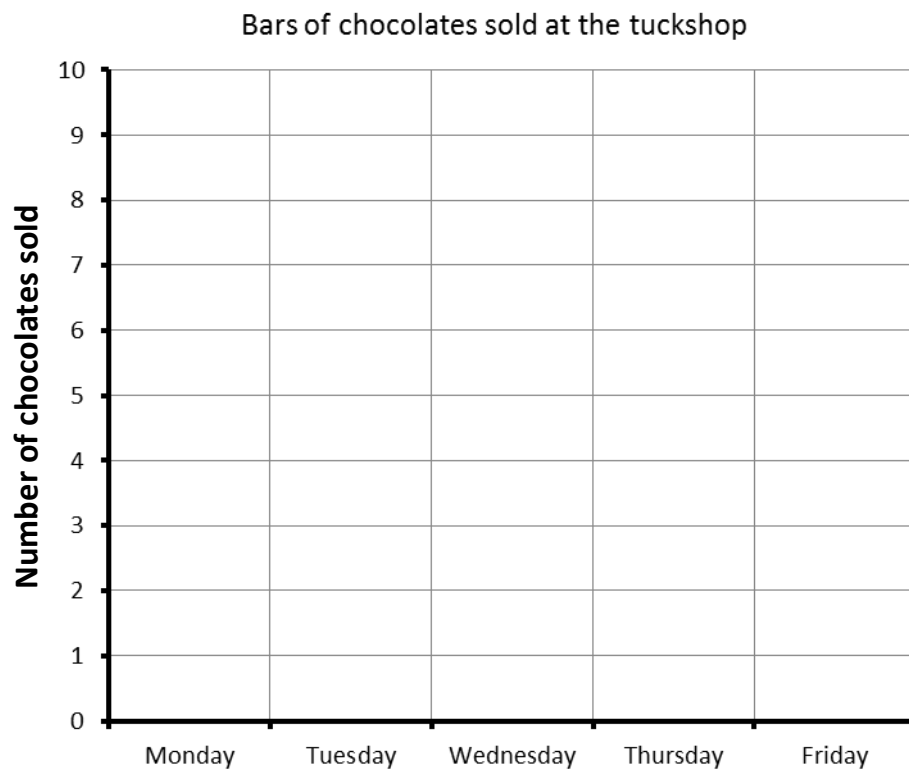
Sports Choice	Number of Children
Athletics	
Cycling	
Cricket	
Hockey	
Horse-riding	
Netball	
Rugby	
Soccer	
Tennis	

- b. Netball
- c. Horse-riding
- d. The school will probably not offer horse-riding because only a very small number of learners take part in this sport.
- e. Pictographs are useful for showing how often something occurs in a visual way that is easy to make sense of and without having to make sense of complicated numbers.

- 5.2(2) a. The table below shows the number of chocolates sold at a tuckshop in a week:

Day	Number of chocolates sold
Monday	10
Tuesday	5
Wednesday	7
Thursday	2
Friday	8

On the grid below draw a *pictograph* to show the data in the table.

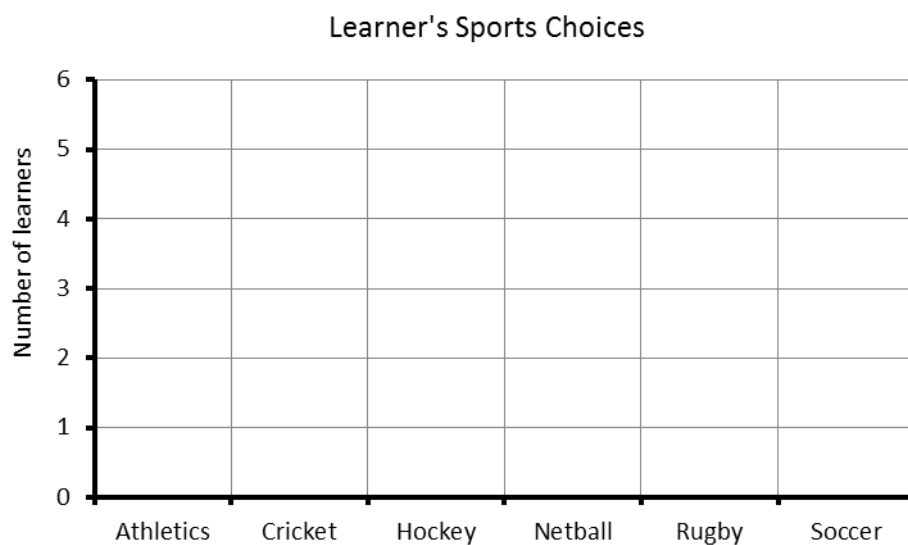


()

- b. The table below shows the number of children in a class who have chosen to do different sports:

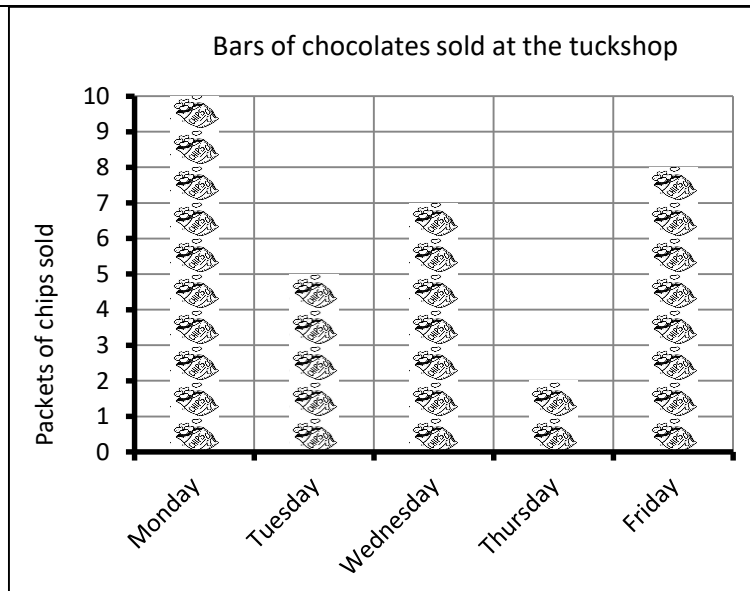
Sports Choice	Number of children
Athletics	2
Cricket	3
Hockey	3
Netball	4
Rugby	1
Soccer	6

On the grid below draw a *bar graph* to show the information in the table:

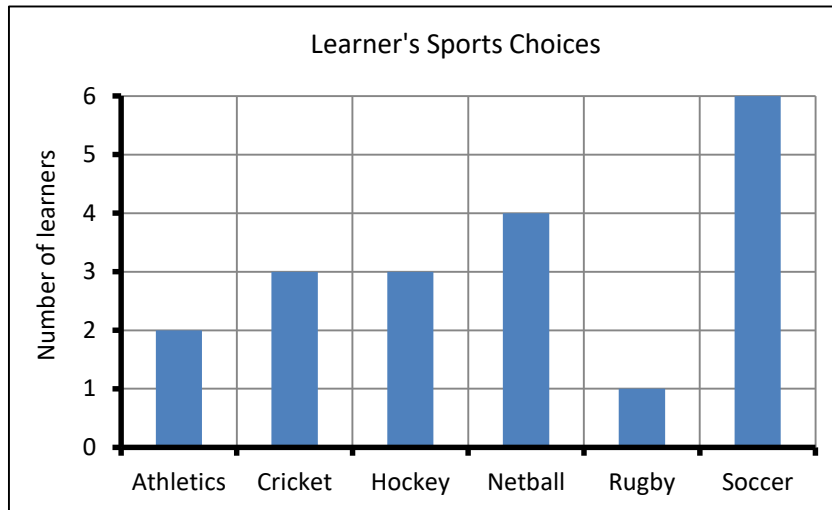


()

Memo: a.

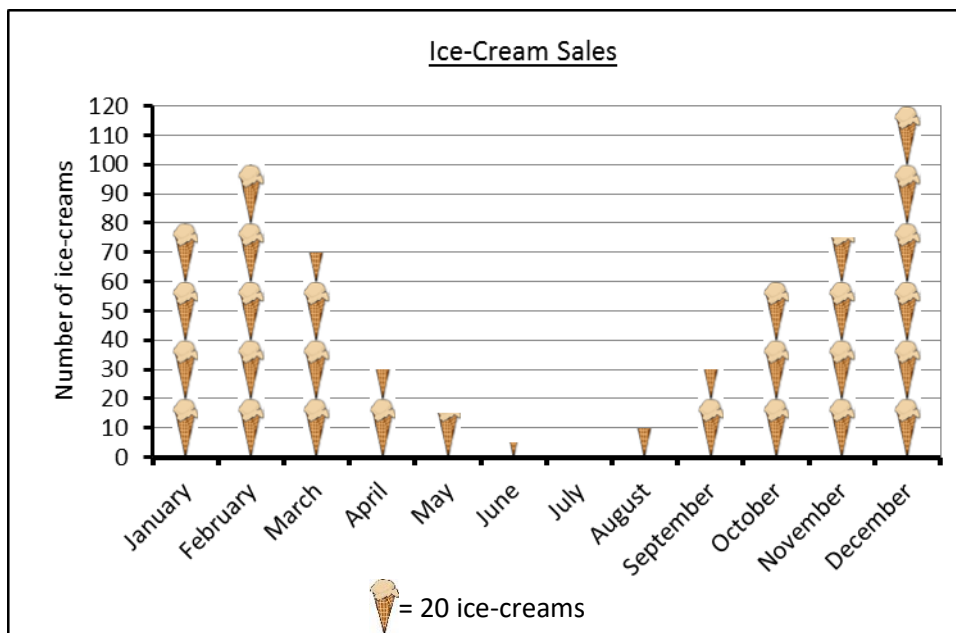


b.



There should be spaces between the bars.

5.2(3) The pictograph below shows the number of ice-creams sold at a shop in Strand:



- How many ice-creams does each picture of an ice-cream cone represent? ()
- In which month were 100 ice-creams sold? ()
- How many ice-creams were sold in January? ()
- How many ice-creams were sold in October? ()
- How many ice-creams were sold in March? ()
- How many ice-creams were sold in May? ()
- Approximately how many ice-creams were sold in June? ()

- h. In which month was the highest number of ice-creams sold? ()
- i. In which month was the lowest number of ice-creams sold? ()
- j. Why do you think the ice-cream sales were so high in January, February, November and December but so low from May to August? ()

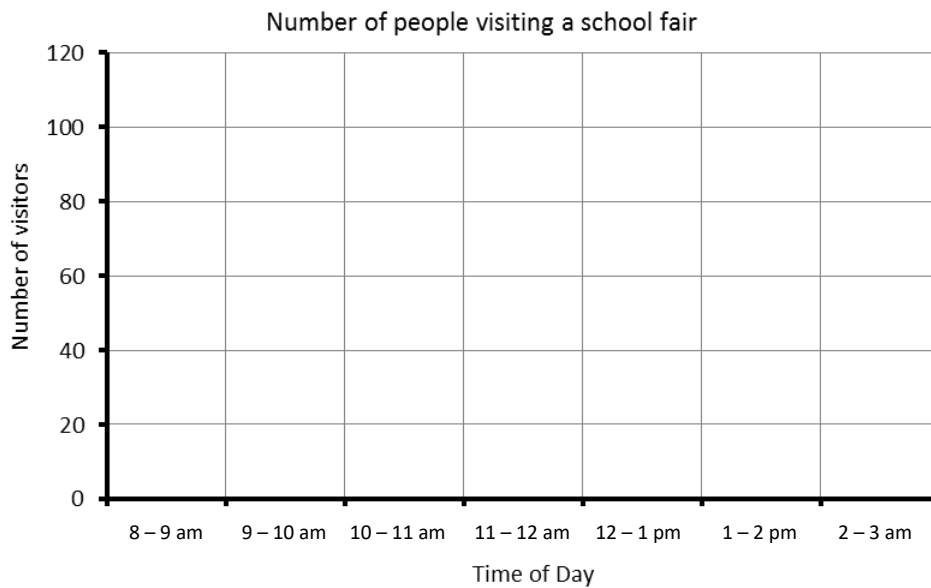
Memo

- a. 20 ice-creams
- b. February
- c. 80 ice-creams
- d. 60 ice-creams
- e. 70 ice-creams (i.e. there are three full pictures which gives 60 ice-creams and one half picture giving 10 ice-creams)
- f. $15 \rightarrow$ i.e. the picture shows $\frac{3}{4}$ of an ice-cream, and $\frac{3}{4}$ of 20 is 15
- g. 5 ice-creams (i.e. the picture looks like $\frac{1}{4}$ of an ice-cream, and $\frac{1}{4}$ of 20 is 5)
- h. December
- i. July (i.e. no ice-creams were sold)
- j. January, February, November and December are all summer months and the temperatures in those months are high. And ice-cream is nice to eat during hot weather. From May to August is winter and the temperatures are cold, and ice-cream is not that nice to eat in cold weather.

- 5.2(4) The table below shows the number of people visiting a school fair during each hour of the day:

Time of day	Number of visitors
8 – 9 am	20
9 – 10 am	40
10 – 11 am	50
11 – 12 am	100
12 – 1 pm	85
1 – 2 pm	30
2 – 3 pm	22

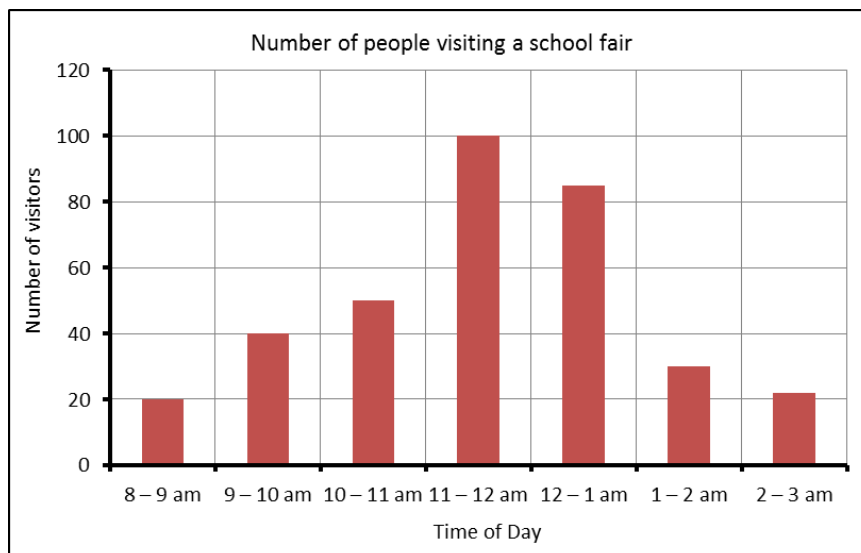
- a. Use the set of axes below to draw a *bar graph* to show the information in the table.



()

- b. At what time of the day did most of the people visit the fair? ()
- c. Why do you think most people arrived at this time? ()
- d. Why do you think the organisers of the fair would be interested in knowing the information shown on the graph? ()
- e. Why is it useful to use a bar graph to show this information? ()

Memo: a.



There should be a space in-between the bars.

b. Between 11 am and 12 am.

c. It is near the middle of the day. Morning chores are done so there is free time to visit the fair. Also, it near lunch time so people may want lunch at the fair.

d. They can plan things like when to make extra parking available, or when to have extra people on duty, or when to have popular events taking place.

e. The bar graph shows in a clear way how the number of visitors attending changes during the day.

5.2(5) The table below marks for a test out of 10 for boys and girls.

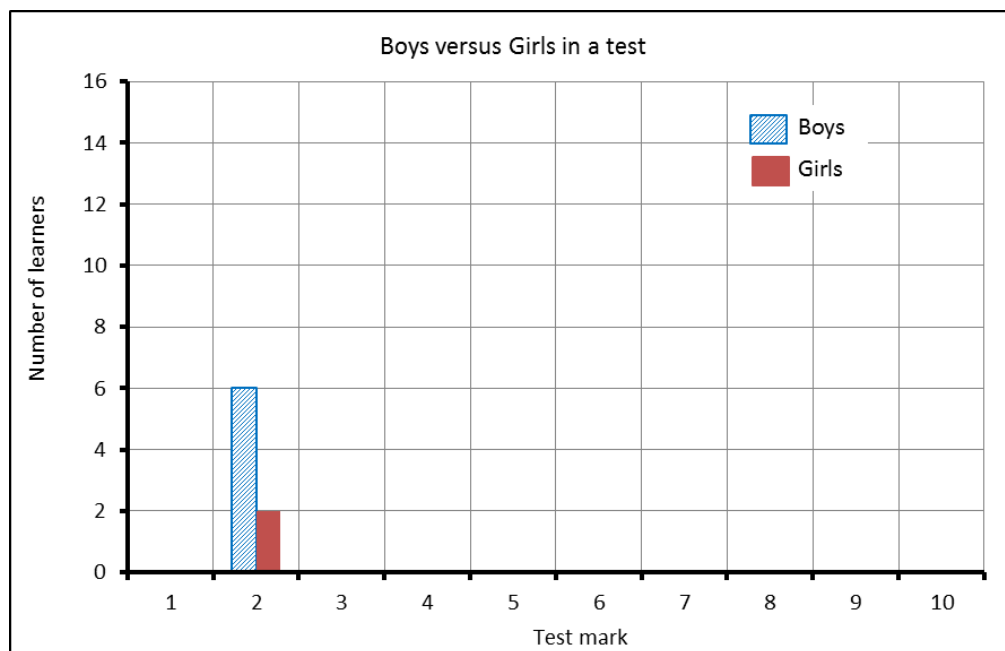
Mark	Number of boys	Number of girls
1	4	0
2	6	2
3	10	4
4	10	4
5	12	2
6	12	8
7	8	10
8	4	12
9	2	16
10	0	10

a. How many learners wrote the test? ()

b. What mark did the greatest number of girls score? ()

c. What mark did the lowest number of boys score? ()

- d. Use the set of axes below to draw a *double bar graph* of this data. One of the columns has been done for you.



()

- e. Did the boys or girls do better in the test? Use the graph to explain your answer.
- f. Explain why it is useful to draw a graph of this data that includes bars for both the boys and girls side-by-side.

()

()

Memo a. $68 \text{ boys} + 68 \text{ girls} = 136 \text{ learners in total.}$

b. 9 marks out of 10

c. 10 marks out of 10 (i.e. no boys scored this mark)

d.



- e. The girls seemed to perform better because most of the girls scored higher marks than the boys, while most of the boys seemed to score marks in the lower mark categories.
- f. Including pictures to represent both boys and girls side-by-side makes it easier to compare the performance of the boys and girls or to compare differences between the two groups.

5.2(6) a. The table below shows test marks out of 100.

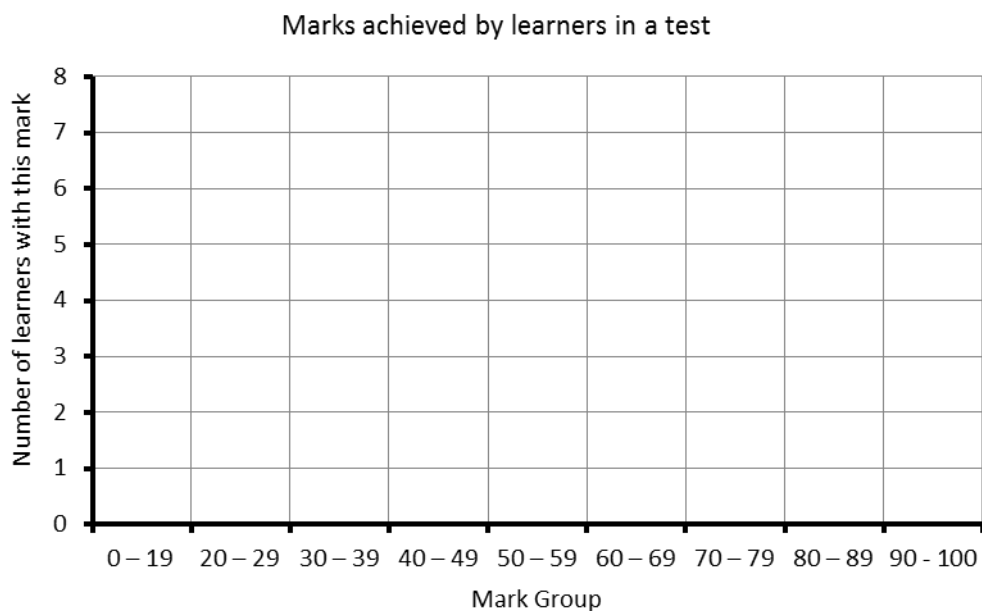
Name	Boy/Girl	Mark
Andiswa	G	11
Cela	B	52
Gabriella	G	60
Haneefah	G	55
Hannes	B	61
Helen	G	62
Imraan	B	70
Jacob	B	72
Jamie	G	33
Jesse	G	75
Julian	B	83
Kate	G	64
Kyle	B	77
Mackinley	B	67
Mcebo	B	55
Mpho	B	91
Pumlile	G	66
Queeneth	G	67
Schalk	B	85
Sphiwe	B	96
Suzie	G	30
Thabile	G	58

- i) How has the information in the table been arranged and why do you think the teacher has arranged it like this?
- ii) Redraw the table and organise the data from lowest to highest mark.

- iii) Use the new table to complete the following:

Mark Group	Tally	Number of learners
0 – 19		
20 – 29		
30 – 39		
40 – 49		
50 – 59		
60 – 69		
70 – 79		
80 – 89		
90 – 100		

- iv) Use the frequency table to draw a single bar graph on the set of axes below:



- v) Did the learners find the test easy, average or hard? Use your graph to explain your answer.
- vi) Redraw the table again. This time organise the data so that all of the information about boys is at the top and their marks are arranged from lowest to highest.

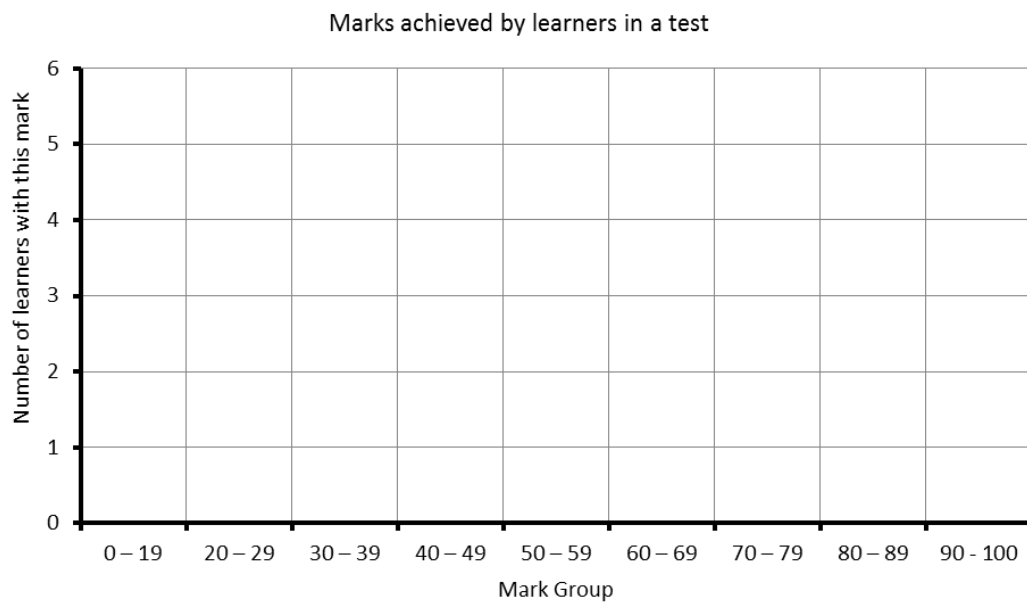
Do the same for the marks for the girls at the bottom of the table.

- vii) Now complete the following table showing the results of the boys and girls separately:

Mark Group	Boys		Girls	
	Tally	Frequency	Tally	Frequency
0 – 19				
20 – 29				
30 – 39				
40 – 49				
50 – 59				
60 – 69				
70 – 79				
80 – 89				
90 – 100				

- viii) Use the information in this table and the axes below to draw a double bar graph.

Don't forget to label which bars are for the boys and which are for the girls.



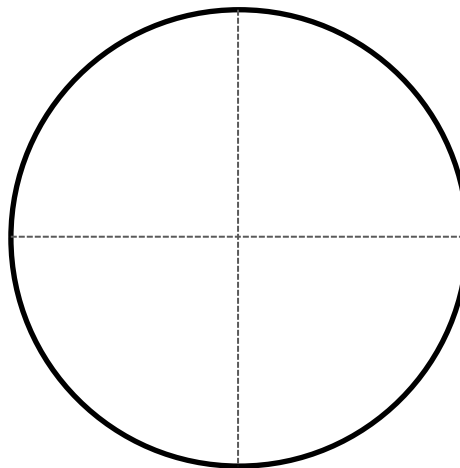
- ix) Who do you think found the test easier – the boys or the girls? Use your graph to explain your answer.
- x) Explain why a double bar graph is a useful graph for showing the data on the test marks for the boys and the girls.

()

- b. A learner surveys children in a class about their favourite fast-food restaurant. The table shows the results of that survey:

Restaurant	Frequency
KFC	25
Steers	10
McDonald's	15

- How many children in total were surveyed?
- What fraction of children chose KFC?
- What fraction of children chose Steers?
- What fraction of children chose McDonald's?
- Draw a pie chart to show how many learners chose each restaurant.



- Why is a pie chart a useful way of showing this data?

()

- c. The table below shows the number of learners who take part in different sports at a school:

Sport	Number of learners
Hockey	100
Netball	50
Soccer	25
Cricket	20
Athletics	5

- How many learners in total play sport?
- Draw a pie chart to show the data in the table.

()

Memo: a. i) In alphabetical order of the names of the learners.

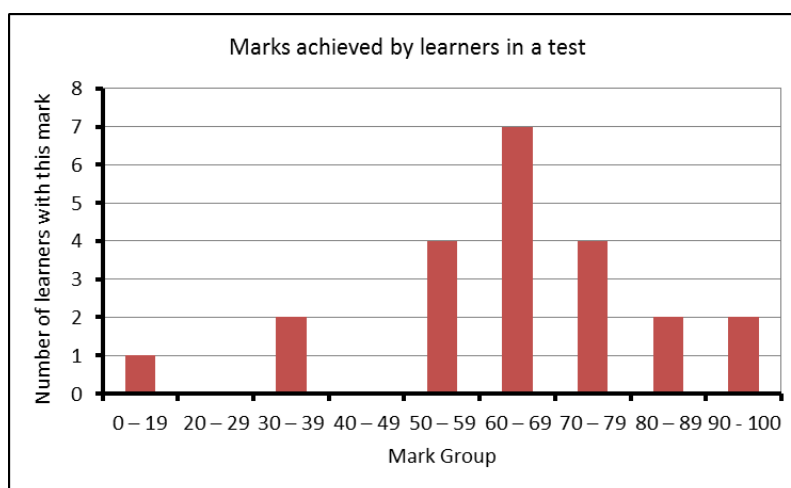
ii)

Name	Boy/Girl	Mark
Andiswa	G	11
Suzie	G	30
Jamie	G	33
Cela	B	52
Haneefah	G	55
Mcebo	B	55
Thabile	G	58
Gabriella	G	60
Hannes	B	61
Helen	G	62
Kate	G	64
Pumlile	G	66
Mackinley	B	67
Queeneth	G	67
Imraan	B	70
Jacob	B	72
Jesse	G	75
Kyle	B	77
Julian	B	83
Schalk	B	85
Mpho	B	91
Sphiwe	B	96

iii)

Mark Group	Tally	Number of learners with this mark
0 – 19		1
20 – 29	---	0
30 – 39		2
40 – 49	---	0
50 – 59		4
60 – 69		7
70 – 79		4
80 – 89		2
90 - 100		2

iv)



v) The learners found the test to be of average difficulty. Most of the learners scored marks above 50 and only a few learners scored very low marks or very high marks.

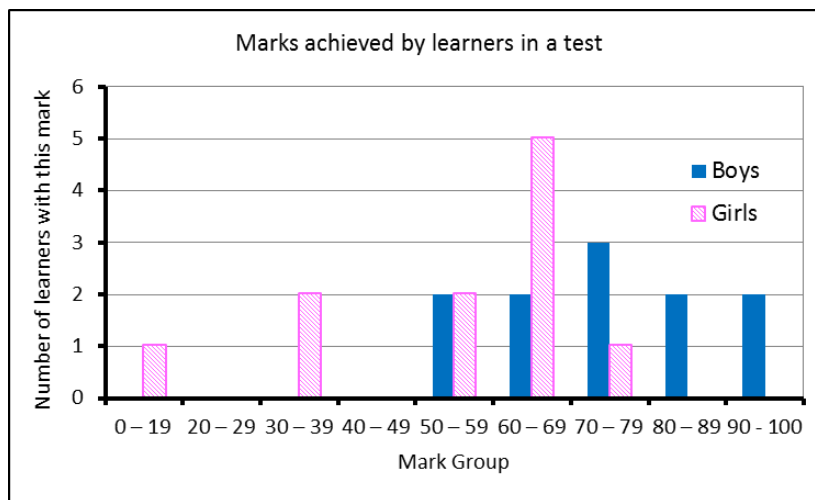
vi)

Name	Boy/Girl	Mark
Cela	B	52
Mcebo	B	55
Hannes	B	61
Mackinley	B	67
Imraan	B	70
Jacob	B	72
Kyle	B	77
Julian	B	83
Schalk	B	85
Mpho	B	91
Sphiwe	B	96
Andiswa	G	11
Suzie	G	30
Jamie	G	33
Haneefah	G	55
Thabile	G	58
Gabriella	G	60
Helen	G	62
Kate	G	64
Pumlile	G	66
Queeneth	G	67
Jesse	G	75

vii)

Mark	Boys		Girls	
	Tally	Frequency	Tally	Frequency
0 – 19	---	0		1
20 – 29	---	0	---	0
30 – 39	---	0		2
40 – 49	---	0	---	0
50 – 59		2		2
60 – 69		2		5
70 – 79		3		1
80 – 89		2	---	0
90 – 100		2	---	0

viii)



ix) The boys did better than the girls because more of the boys got marks above 50 while only some of the girls got above 50 marks. Also, some of the boys got marks in the 80-89 and 90-100 groups, while none of the girls got marks in these groups.

x) A double bar graph is very useful for comparing how often two or more different items occur.

b. i) 50 learners

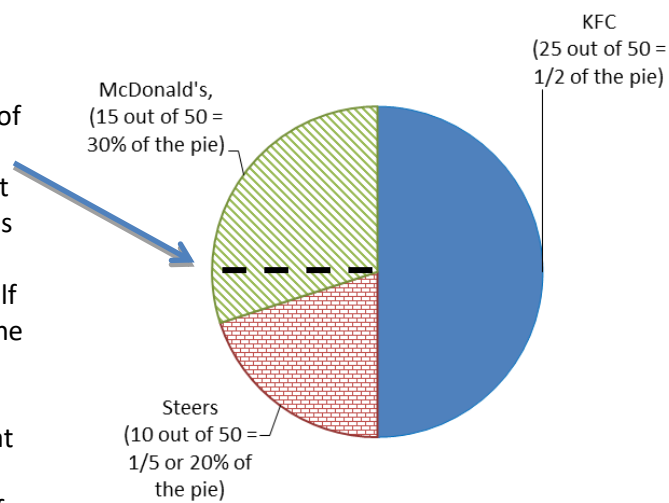
ii) Fraction of total who chose KFC = $\frac{1}{2}$ (or 50%) (i.e. 25 is half of 50)

iii) Fraction of total who chose Steers = $\frac{1}{5}$ (or 20%) (i.e. 10 is $\frac{1}{5}$ of 50)

iv) Fraction of total who chose McDonalds = $\frac{15}{50} = \frac{3}{10}$ (or 30%)

- v. This line divides this half of the pie into two equal halves which will each represent 25% of the pie. So, the segment for Steers that is 20% must be smaller than half of this side of the pie; and the segment for McDonald's that is 30% must be bigger than half of this side of the pie.

Fast food restaurant choices of learners in a class



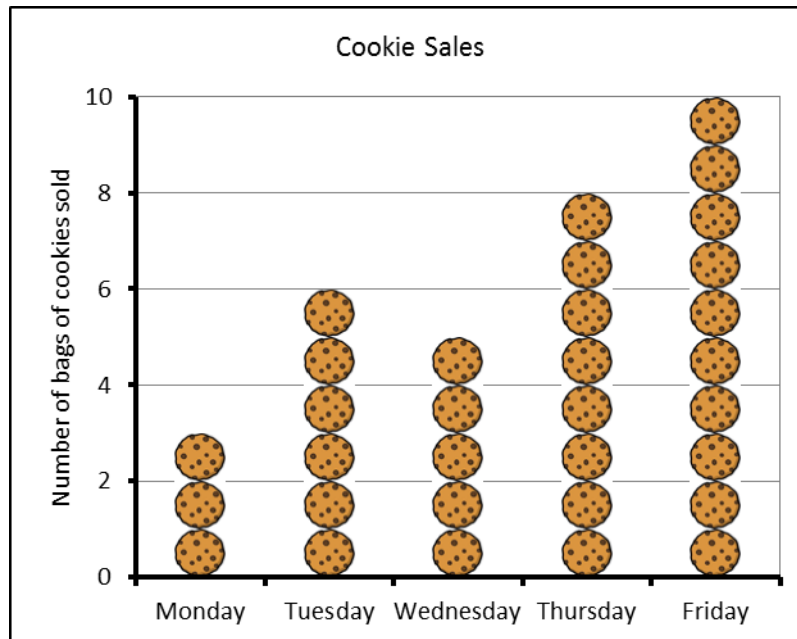
- vi) The pie chart is useful for showing how big each segment is in relation to the whole group.

- c. i) 200 learners

- ii)
-
- This segment is approximately 1/10th of the pie and represents
- This segment is 1/8th of the pie and represents Soccer
- This segment is 1/4 of the pie and represents Netball
- This small leftover segment represents Athletics and is approximately 2,5% of the pie
- This segment is half of the pie and represents Hockey

5.3 Analysing, Interpreting and Reporting Data

- 5.3(1) A girl is selling bags of cookies. The pictograph shows the number of bags that she sold in a week.

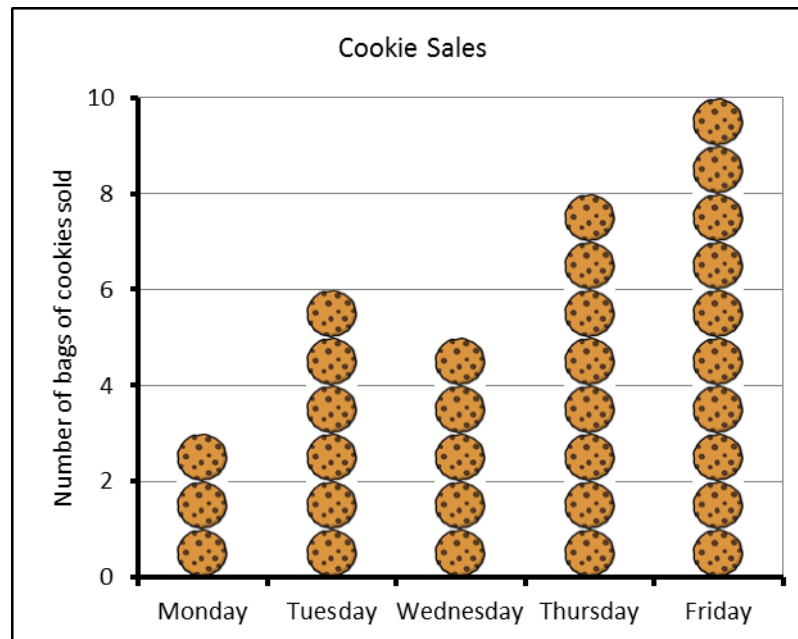


- How many bags did the girl sell on Tuesday? ()
- How many bags did the girl sell on Wednesday? ()
- How many bags did the girl sell in total for the whole week? ()
- Are there any two days on which the girl sold the same number of bags? ()

- Memo:**
- 6 bags
 - 5 bags
 - Total bags = $3 + 6 + 5 + 8 + 10 = 32$
 - No

5.3(2)

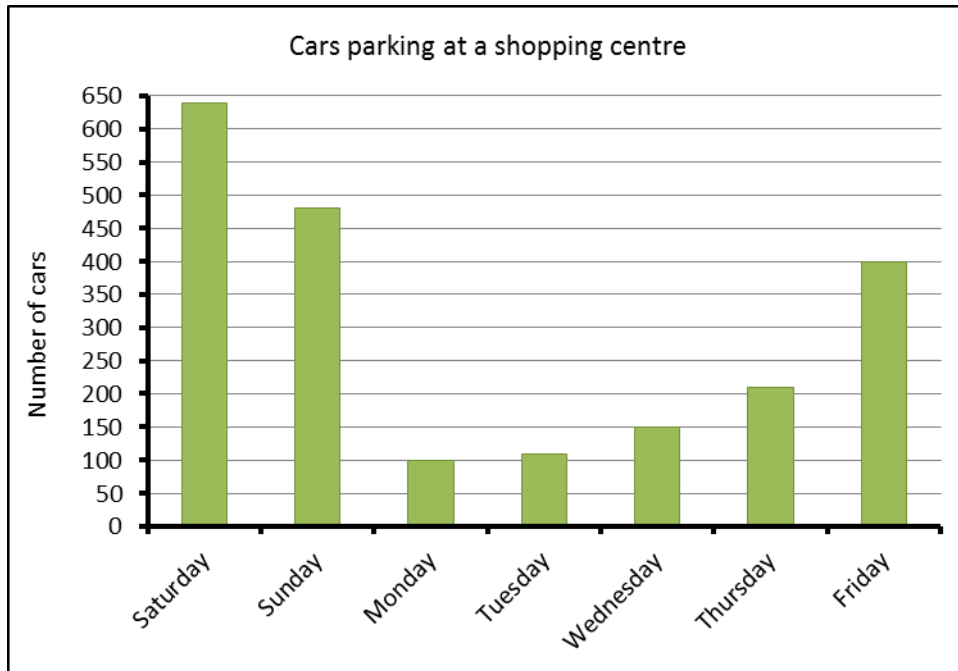
- a. A girl is selling bags of cookies. The pictograph below shows the number of bags that she has sold in a week.



- How many bags did the girl sell on Tuesday?
- How many bags did the girl sell on Wednesday?
- How many bags of cookies did the girl sell in total for the whole week?
- On which day did the girl sell fewer bags of cookies than on the day before?
- Did the girl sell more bags at the beginning of the week or the end of the week? Give a possible reason for this.
- If each bag has 5 cookies in it, how many cookies did the girl sell on Monday?
- If each bag of cookies has 5 cookies, how many cookies did the girl sell in total for the whole week?
- If the girl sells each bag of cookies for R2,00, how much money did she receive on Tuesday?
- If the girl sells each bag of cookies for R2,00, how much money did she receive in total for the whole week?

()

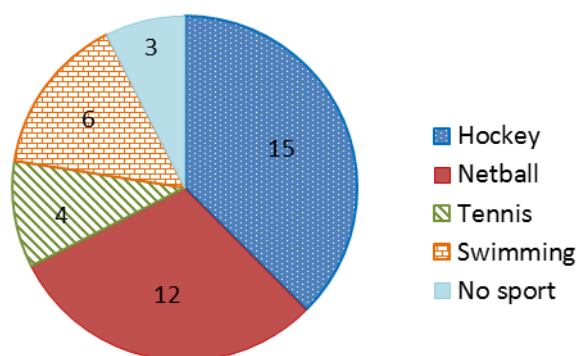
b. The picture below shows a bar graph.



- Look at the headings. What information is shown on the graph?
- How many cars parked at the shopping centre on Monday?
- On which day did 110 cars park at the shopping centre?
- Approximately how many cars parked at the shopping centre on Saturday?
- Which two days were the busiest at this shopping centre?
- Give one reason why these two days are the busiest.
- Why could the data shown in the graph be helpful to the shopping centre manager?

()

c. Below is a pie chart showing the number of girls in a class who play different sports.



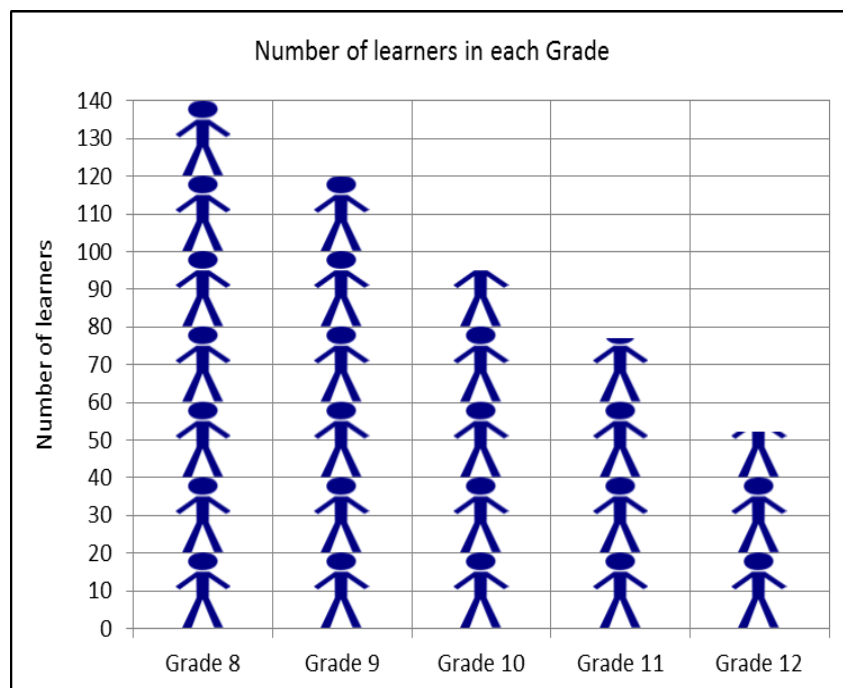
- i) How many girls play Hockey?
- ii) How many girls do not play sport?
- iii) How many girls are there in total in this class?
- iv) How many girls in total play sport?
- v) How many girls play Hockey or Netball?
- vi) What is the most popular sport played by the girls?
- vii) What is the least popular sport played by the girls?
- viii) Why is a pie chart a useful graph for showing this data? ()

Memo

- a.
 - i) 6 bags
 - ii) 5 bags
 - iii) Total bags = $3 + 6 + 5 + 8 + 10 = 32$
 - iv) Wednesday
 - v) On most of the days (except for Wednesday) the number of bags sold each day increased from the day before.
 - vi) 3 bags with 5 cookies in each bag = $3 \times 5 = 15$ cookies
 - vii) 160 cookies
 - viii) R12
 - ix) R64,00
- b.
 - i) The number of cars parking at a shopping centre on different days of the week.
 - ii) 100 cars
 - iii) Tuesday
 - iv) 640 cars
 - v) Saturday and Sunday
 - vi) These days are during the weekend, which is when most people are free to do shopping.

- vii) The manager can use this data to plan how many people to expect at the shopping centre on different days, and he/she can use this information to plan how many people to have working, or how many parking spaces are needed.
- c.
- i) 15 girls
 - ii) 3 girls
 - iii) 40 girls
 - iv) 37 girls
 - v) 27 girls
 - vi) Hockey
 - vii) Tennis
- viii) The pie chart is useful for showing how things relate to each other but also in relation to all options. So it is easy to visualise that more girls choose hockey over other sports, but also to see how big the hockey portion is compared to all other choices.

5.3(3) a. Look at the pictograph below:



- i) How many learners does each picture of a person represent?
- ii) How many learners are there in Grade 8?

- iii) Approximately how many learners are there in Grade 10?
- iv) Which grade has 52 children?
- v) Are there more children in the higher grades or the lower grades?
Give a possible reason for this. ()

- b. The table below shows a record of the amount of pocket money received by a group of learners.

Sandeep	R30
Mthandeni	R50
Kerryn	R10
Charlie	R80
Busi	R30
Botshiwe	R20
Marius	R30
Rebecca	R40
Cela	R20
Khosi	R30
Petronella	R45

- i) Who receives the most pocket money?
- ii) Who receives the least pocket money?
- iii) Which learner received R50 pocket money?
- iv) What is the modal (or most common) amount of pocket money they receive?
- v) Kerryn gets R20 pocket money. Explain how she could argue to her parents that they should give her more pocket money. ()

- c. The list below shows the marks that learners scored in a test that was out of a total of 10 marks:

7 2 5 7 1 9 6 5 5 7 3
 4 7 6 8 2 7 4 7 2 9 7
 ...

- i) Arrange these marks in order from the lowest to the highest mark.
- ii) What is the lowest mark?
- iii) What is the highest mark?
- iv) What is the modal mark (the mark that appears most often)?
- v) Why do you think the teacher might want to know the modal mark? ()

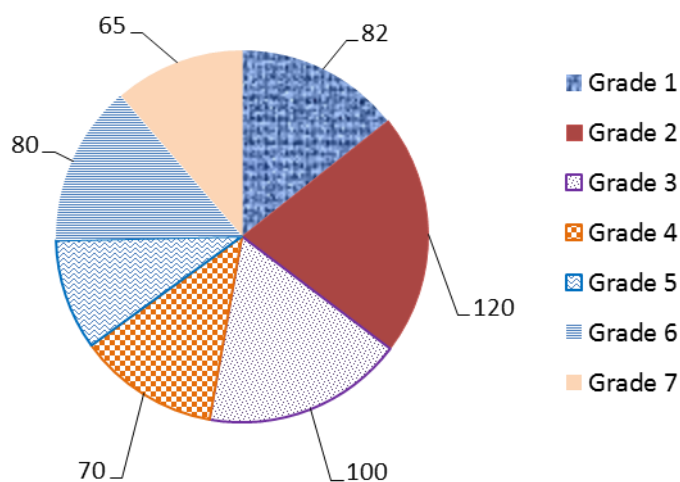
d. Consider the following table:

Age group	Tally	Number of people
18 years or younger		
19 – 24 years	 	
25 – 34 years	 	
35 – 49 years	 	
more than 50 years old		

- Complete the table by writing down the number of people in each age group.
- Give a possible situation that the information in the table might represent.
- Which age group had the lowest number of people recorded?
- In which age group would a 29 year old person be included?
- In which age group would a 35 year old person be included?
- Give a reason why age groups have been used rather than writing down every possible age.

()

e. The pie chart below shows the number of learners in different grades in a school.

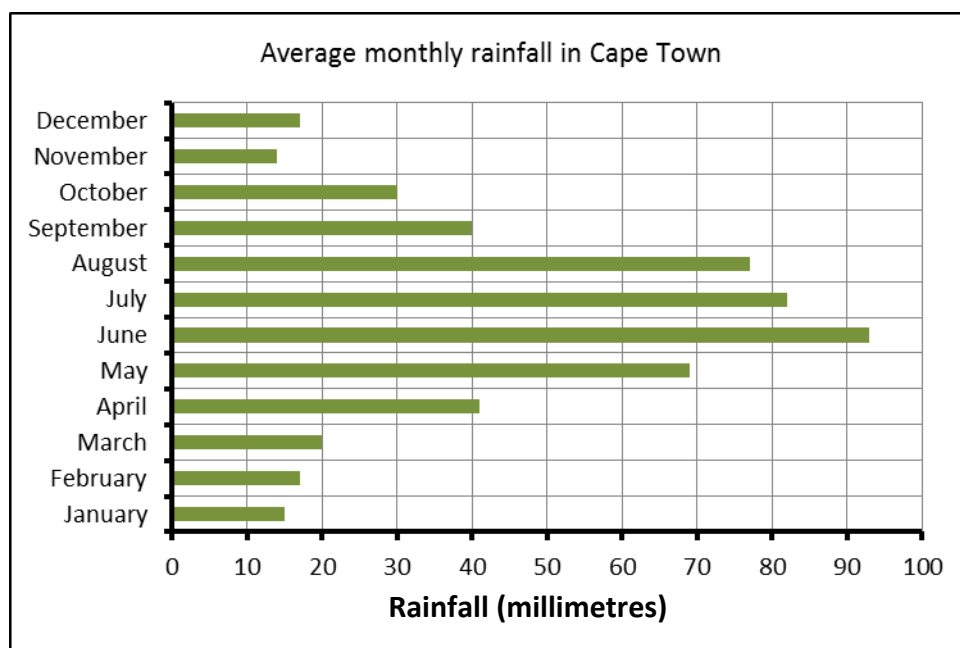


- How many learners are there in Grade 1?

- ii) Which grade has 100 learners?
- iii) Which grade has the most learners?
- iv) If there are 572 learners in the school, work out how many learners there are in Grade 5.
- v) Give two reasons why it would be important for the principal of the school to know the information shown in the pie chart.
- vi) Give a reason why it is sometimes useful to show information in a graph rather than just in a table.

()

f. The bar graph below shows the average monthly rainfall in Cape Town:



- i) How many millimetres of rain fell in March?
- ii) Approximately how much rainfall was there in April?
- iii) In which month did 82 millimetres of rain fall?
- iv) How many millimetres of rain fell in total in September and October?
- v) In which month did the least amount of rain fall?
- vi) In which month did the most amount of rain fall?
- viii) Cape Town is said to have a 'Winter rainfall pattern'. Explain if this is this true according to the information in the graph.

()

Memo	<p>a. i) 20 learners</p> <p>ii) 140 learners</p> <p>iii) 95 learners</p> <p>iv) Grade 12</p> <p>v) There are more children in the lower grades. A possible reason is that in the higher grades the work is more difficult and, so, it is harder for more learners to pass. And some learners who don't pass might drop out of the school. Or some learners leave school in the higher grades so that they can start to work.</p> <p>b. i) Charlie</p> <p>ii) Kerryyn</p> <p>iii) Mthandeni</p> <p>iv) R30 → this appears for four learners.</p> <p>v) <i>Possible answer:</i> Since the most common amount of pocket money is R30, it would be fair if she asked for this amount from her parents.</p> <p>c. i) 1; 2; 2; 2; 3; 4; 4; 5; 5; 5; 6; 6; 7; 7; 7; 7; 7; 7; 8; 9; 9</p> <p>ii) Once the marks are arranged it becomes easier to make sense of the marks in terms of the lowest mark, highest mark, mark that occurs most often, and so on.</p> <p>iii) 1 mark out of 10</p> <p>iv) 9 marks out of 10</p> <p>v) 7 marks out of 10</p> <p>vi) Since the modal mark gives the mark that more learners scored, if it is high it might show that the learners did well in the test, but if it is low then the teacher might use this as an indication that the learners found the test hard.</p>
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d.	i)	Age group	Tally	Number of people
		18 years or younger		13
		19 – 24 years	 	27
		25 – 34 years	 	52
		35 – 49 years	 	41
		more than 50 years old		7
ii) <i>Any possible scenario that refers to the number of people in different age groups. For example:</i>				
<ul style="list-style-type: none"> The ages of shoppers visiting a shopping centre The ages of people attending a sports match 				
iii) More than 50 years old				
iv) 25 – 34 years				
v) 35 – 49 years				
vi) There are too many ages to include every possible age in the table. As such, age groups provide a useful way for grouping information and for reducing the amount of information that has to be included.				
e.	i)	82 learners		
	ii)	Grade 3		
	iii)	Grade 2		
	iv)	55 learners		
	v)	<i>Examples of possible reasons:</i>		
		<ul style="list-style-type: none"> To determine how many teachers are needed in each grade. To determine the resources (books, stationary) needed for each grade. If there is a feeding scheme, to determine how much food to cook. 		

- vi) The graph shows a visual or picture image of the information. And sometimes it is easier to make sense of the information when it is shown as a picture rather than just as numbers in a table.
- f.
 - i) 20 millimetres (mm)
 - ii) About 42 millimetres (mm)
 - iii) July
 - iv) 70 mm
 - v) November (just less than January)
 - vi) June
 - vii) Yes, this is true. The highest bars which indicate the highest rainfall all occur in or near winter (May, June, July). The lowest rainfall months are those in summer (December and January). So the graph does show that Cape Town has a Winter rainfall pattern.

- 5.3(4) a. The table below shows the marks out of 10 scored by learners in a small test:

Name	Mark
Clement	8
Ebrahim	2
Haanifa	10
Jakobus	9
Jemimah	7
Khosi	8
Marius	2
Mpho	6
Petrus	2
Sanele	9
Taahir	10
Thandeka	6
Thando	7

- i) Redraw the table and arrange the data from the lowest to highest mark.
- ii) Which mark is the mode of the data?
- iii) Find the median mark for the class.
- iv) Explain why this median mark gives a better representation of how the whole class performed.

()

b. The table below shows the heights of a group of people:

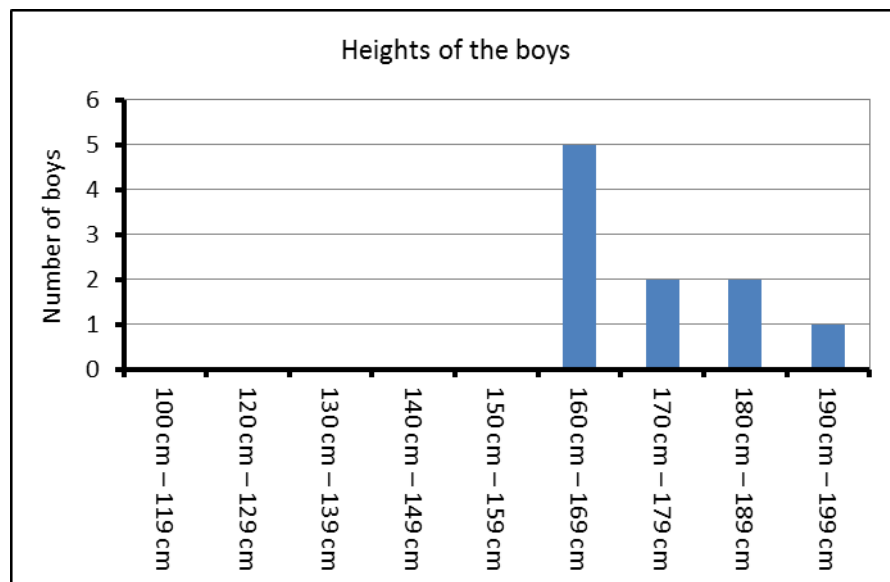
<u>Name</u>	<u>Boy or Girl</u>	<u>Height (in centimetres)</u>
Anele	B	163 cm
Callyn	G	110 cm
Chloe	G	125 cm
Gladys	G	120 cm
Jacob	B	175 cm
Johannes	B	170 cm
Julian	B	162 cm
Katherine	G	140 cm
Marc	B	180 cm
Maryna	G	162 cm
Nosipho	G	150 cm
Ofentse	G	130 cm
Pieter	B	190 cm
Rethabile	G	146 cm
Sasha	G	135 cm
Sello	B	162 cm
Sello	B	162 cm
Sophy	G	152 cm
Sphiwe	B	165 cm
Theresa	G	124 cm
Xavier	B	183 cm

- i) Redraw the table and arrange the data from the lowest to highest height.
- ii) Who is the shortest person in the group?
- iii) Who is the tallest person in the group?
- iv) Who has a height of 125 cm?
- v) How tall is Sophy in metres?
- vi) What is the modal height for the group?
- vii) Find the median height for the group.
- viii) What do these modal and median height values tell us about the group?
- ix) Redraw the table. Order the data for the boys is at the top of the table and arrange from shortest to tallest.
Do the same for the heights of the girls in the bottom of the table.
- x) Find the median height for the boys.

- xi) Find the median height for the girls.
- xii) The median height for the boys is bigger than for the girls. What does this mean?
- xiii) Arrange the data in a grouped frequency table like the one below.

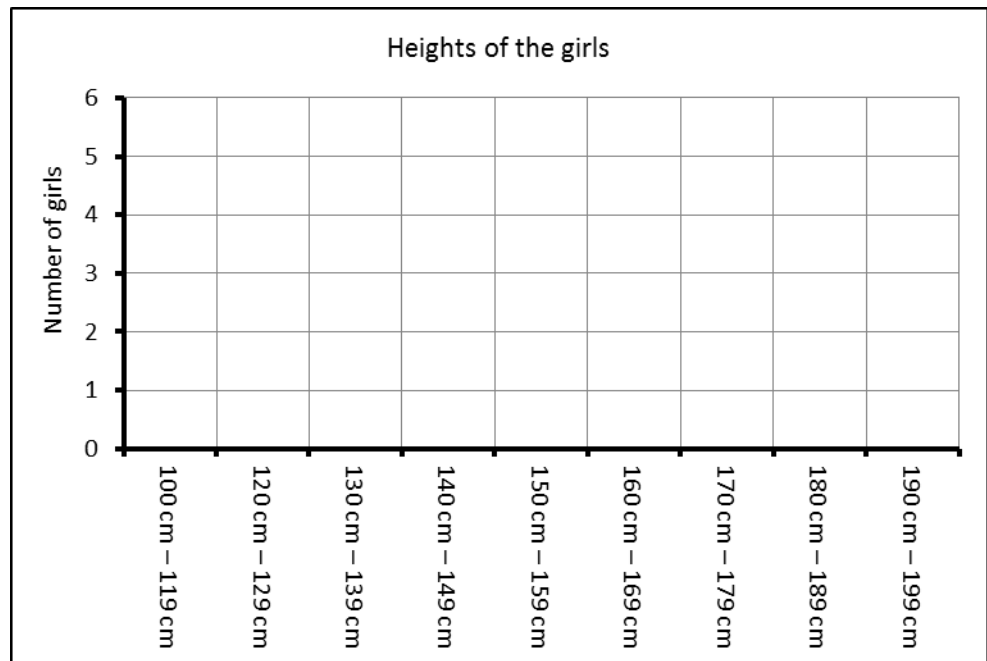
Height group	How many <u>Boys</u> ?	How many <u>Girls</u> ?
100 cm – 119 cm		
120 cm – 129 cm		
130 cm – 139 cm		
140 cm – 149 cm		
150 cm – 159 cm		
160 cm – 169 cm		
170 cm – 179 cm		
180 cm – 189 cm		
190 cm – 199 cm		

- xiv) The bar graph below shows the number of boys with heights in each of the height groups.



Why are there no bars for the first 5 height categories?

- xv) Draw a similar graph to show the heights of the girls on the blank axes below.



- xvi) Look at the two graphs for the boys and the girls.

Using the graphs, explain how the height of the girls is different to the boys.

- xvii) Explain why it would have been easier to compare the heights of the boys and the girls if the bars were all drawn on one set of axes (a *double bar graph*) rather than on separate graphs.

()

c. Look at the bar graph below:



A learner provides the following explanation of what is happening in the graph:

"The graph shows that the busiest days at the zoo are in the middle of the week and that quietest days at the zoo are at the end of the week during the weekend."

Explain if you agree with what this learner is saying and give a reason why you agree or disagree.

()

Memo

a. i)

Name	Mark
Ebrahim	2
Marius	2
Petrus	2
Mpho	6
Thandeka	6
Jemimah	7
Thando	7
Clement	8
Khosi	8
Jakobus	9
Sanele	9
Haanifa	10
Taahir	10

ii) Mode = 2 marks

iii) Median mark = 7 marks

- iv) This middle mark is much closer to the marks scored by the majority of the in the class and, as such, provides a much better idea of the average mark for the class.

b. i)

Name	Boy or Girl	Height (in centimetres)
Callyn	G	110 cm
Gladys	G	120 cm
Theresa	G	124 cm
Chloe	G	125 cm
Ofentse	G	130 cm
Sasha	G	135 cm
Katherine	G	140 cm
Rethabile	G	146 cm
Nosipho	G	150 cm
Sophy	G	152 cm
Julian	B	162 cm
Sello	B	162 cm
Sello	B	162 cm
Maryna	G	162 cm
Anele	B	163 cm
Sphiwe	B	165 cm
Johannes	B	170 cm
Jacob	B	175 cm
Marc	B	180 cm
Xavier	B	183 cm
Pieter	B	190 cm

- ii) Callyn
- iii) Pieter
- iv) Chloe
- v) 1,52 metres
- vi) Modal height = 162 cm
- vii) Median height = 162 cm (the shaded cell in the table above)
- viii) The modal and median heights tell us that the average height of the whole group is around 162 cm.

ix)

Name	Boy or Girl	Height (in centimetres)
Julian	B	162
Sello	B	162
Sello	B	162
Anele	B	163
Sphiwe	B	165
Johannes	B	170
Jacob	B	175
Marc	B	180
Xavier	B	183
Pieter	B	190
Callyn	G	110
Gladys	G	120
Theresa	G	124
Chloe	G	125
Ofentse	G	130
Sasha	G	135
Katherine	G	140
Rethabile	G	146
Nosipho	G	150
Sophy	G	152
Maryna	G	162

x) Median height of boys = 167,5 cm

xi) Median height of girls = 135 cm (shown on the table above)

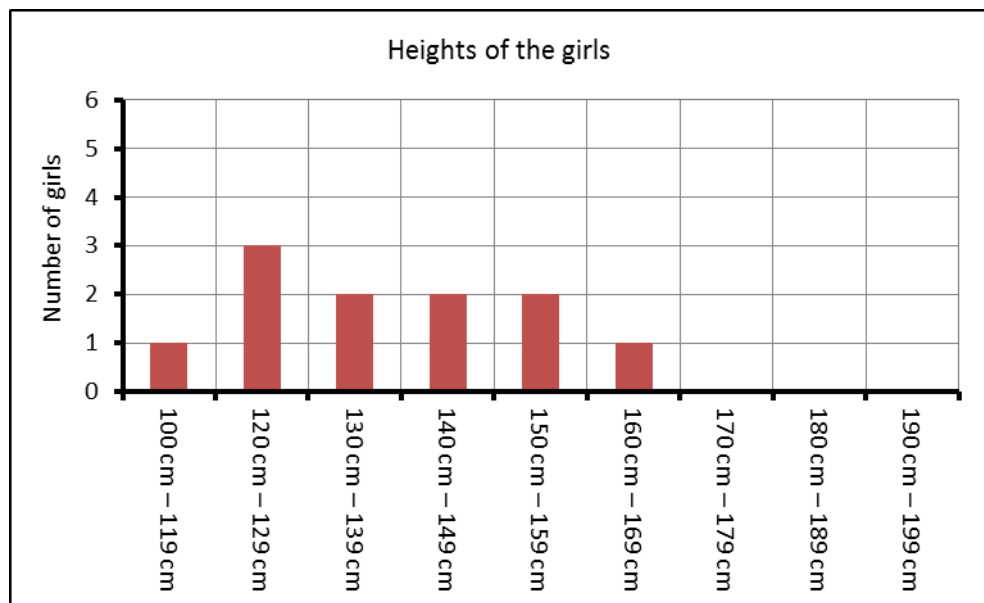
xii) That on average the boys in this group are taller than the girls.

xiii)

Height group	How many <u>Boys</u> ?	How many <u>Girls</u> ?
100 cm – 119 cm	0	1
120 cm – 129 cm	0	3
130 cm – 139 cm	0	2
140 cm – 149 cm	0	2
150 cm – 159 cm	0	2
160 cm – 169 cm	5	1
170 cm – 179 cm	2	0
180 cm – 189 cm	2	0
190 cm – 199 cm	1	0

xiv) There are no boys that have heights that fall in the height groups for the first five spaces on the graph.

xv)



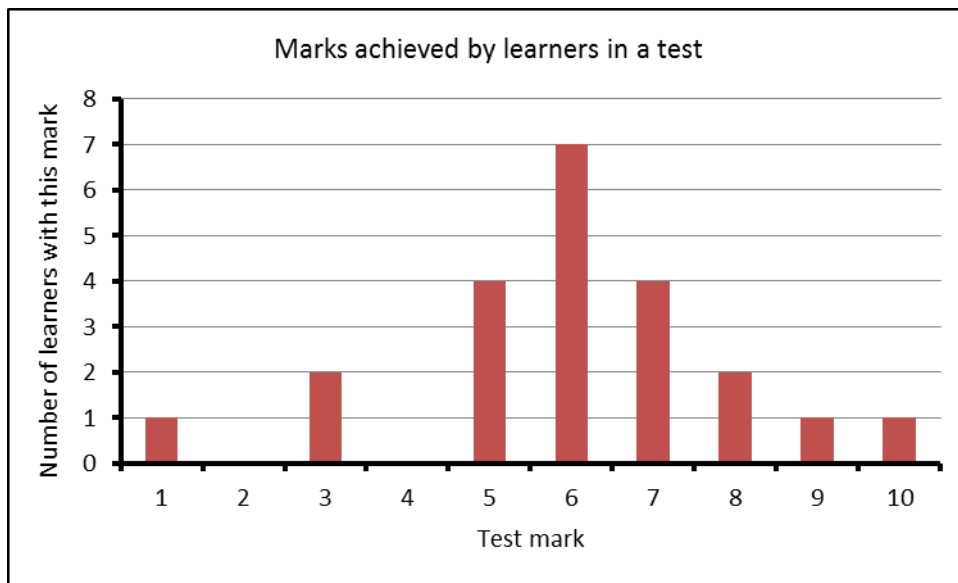
xvi) The girls all have quite low heights, with only one girl having a height that falls in the 160 cm – 169 cm group. All of the other girls have heights that fall below this group.

The boys, on the other hand, all have heights that fall in or above the 160 cm to 169 cm group. This shows that most of the boys are taller than the girls.

xvii) If the bars had all been on one set of axes, it would have been easier to compare the bars because they would have been positioned next to each other. When they are on separate axes it is harder to compare.

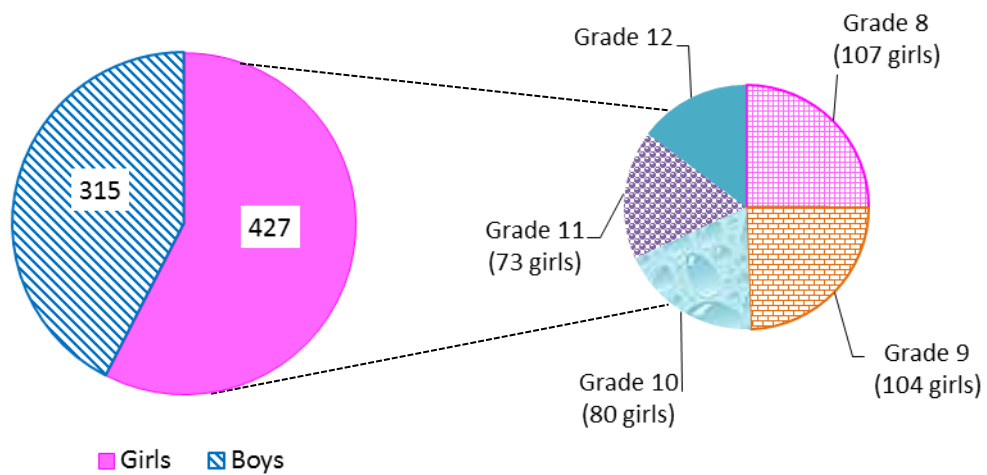
- c. The statement is not correct. Reading the labels on the horizontal axis, the highest number of people visit on Saturday and Sunday – which are during the weekend. The lowest number of people visit during the week, and especially at the beginning of the week (on Monday and Tuesday).

5.3(5) a. The graph below shows the marks achieved by learners in a test out of 10.



- i) How many learners scored 3 marks for the test?
- ii) How many learners scored 4 marks for the test?
- iii) What is the modal mark for this test?
- iv) Use the information on the graph to write down a list of all of the marks scored by all of the learners in this class.
- Make sure to write the list in arranged order from lowest to highest mark.
- v) Find the median mark for the test.
- vi) Why is it useful for the teacher to know the median mark for the test?
- vii) Why could you not find the median mark directly from the graph? ()

b. Look at the pie charts below describing learners at a school.

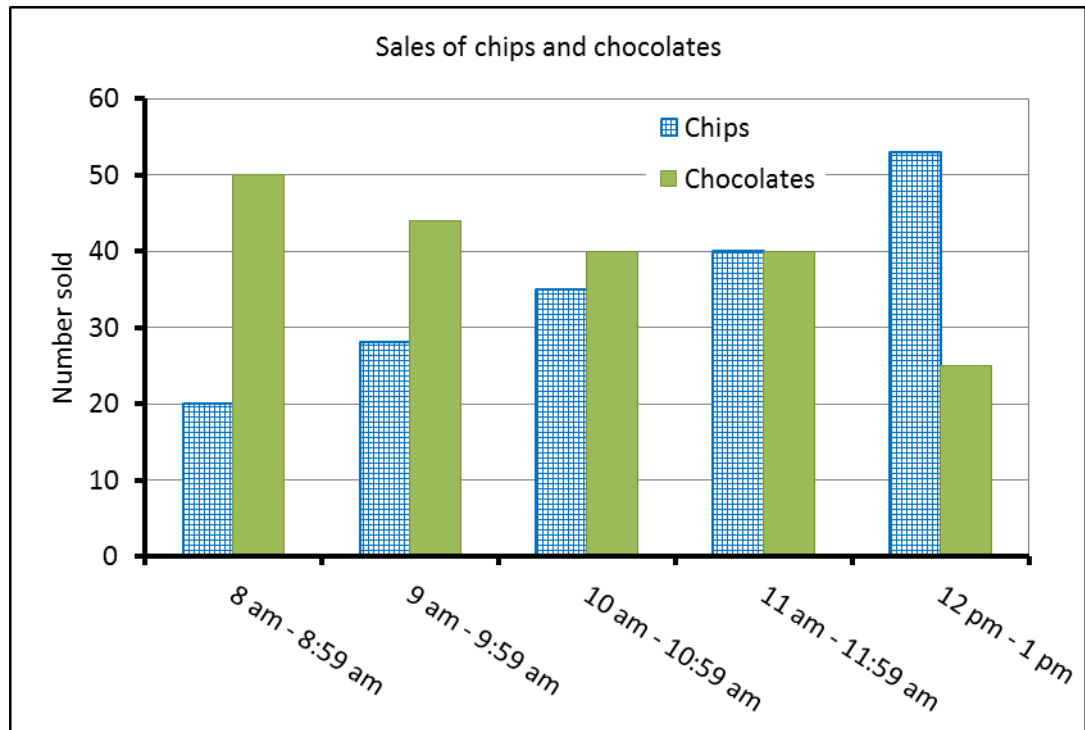


- i) What data does the bigger pie chart represent?
- ii) What data does the smaller pie chart represent?
- ii) How many girls are there in the school?
- iv) How many learners are there in total in the school?
- v) How many of the girls are in Grade 8?
- vi) How many girls there are in Grade 12?

()

- c. Two learners have a stand at a school fair. One learner is selling chips and the other is selling chocolate.

The double bar graph below shows the number of chips and chocolates sold by each learner at different times in the day:



- i) How many packets of chips were sold between 8 am and 8:59 am?
- ii) How many chocolate bars were sold between 10 am and 10:59 am?
- iii) In what time period were 35 packets of chips sold?
- iv) In what time period were 25 chocolate bars sold?
- v) Approximately how many packets of chips were sold between 9 am and 9:59 am?
- vi) Compare the sales of the chips and chocolates and explain how the sales of each item changed during the day.
- vii) Which learner sold the most? Use the graph to explain your answer. ()

Memo: a. i) 2 learners
 ii) 0 learners
 iii) 6 marks
 iv) 1 ; 3 ; 3 ; 5 ; 5 ; 5 ; 5 ; 6 ; 6 ; 6 ; 6 ; 6 ; 6 ; 7 ; 7 ; 7 ; 7 ; 8 ; 8 ; 9 ; 10

- v) The median mark is the mark that is underlined in the list above = 6 marks
 - vi) The median mark provides the teacher with a single mark that shows the average performance of the whole class.
 - vii) You can only determine the median from the actual set of data. As such, we first needed to write down the original list of marks by reading these values from the graph.
- b.
- i) A comparison between the number of boys and girls.
 - ii) A comparison of the number of girls in each grade in a school.
 - iii) 427 girls
 - iv) Total students = 742
 - v) 107 girls in Grade 8
 - vi) Girls in Grade 12 = 63
- c.
- i) 20 packets
 - ii) 40 bars
 - iii) 10 am – 10:59 am
 - iv) 12 pm – 1 pm
 - v) ≈ 28 packets
 - vi) The packets of chips sold started off low but increased steadily during the day.

The bars of chocolate sold started off quite high but dropped steadily during the day.
 - vii) Approximate packets of chips sold = $20 + 28 + 35 + 40 + 53 = 176$

Approximate bars of chocolate sold = $50 + 44 + 40 + 40 + 25 = 199$

So, the learners selling the bars of chocolate won the bet.

5.3(6) a. The table below shows the marks out of 10 scored by learners in a test.

Name	Mark
Aarnout	1
Blessing	8
Fanie	6
Hermoine	6
Jackie	1
Jeremiah	8
Kerry	1
Linda	5
Nombuso	5
Petrus	10
Philemon	8
Sinilizwe	6
Tania	1
Thandeka	7
Thuli	7
Vuyo	10

- i) Work out the modal mark for the test.
- ii) Work out the median mark for the test.
- iii) Does the modal mark or the median mark give a better picture of how the whole class performed in the test? Explain your answer.

()

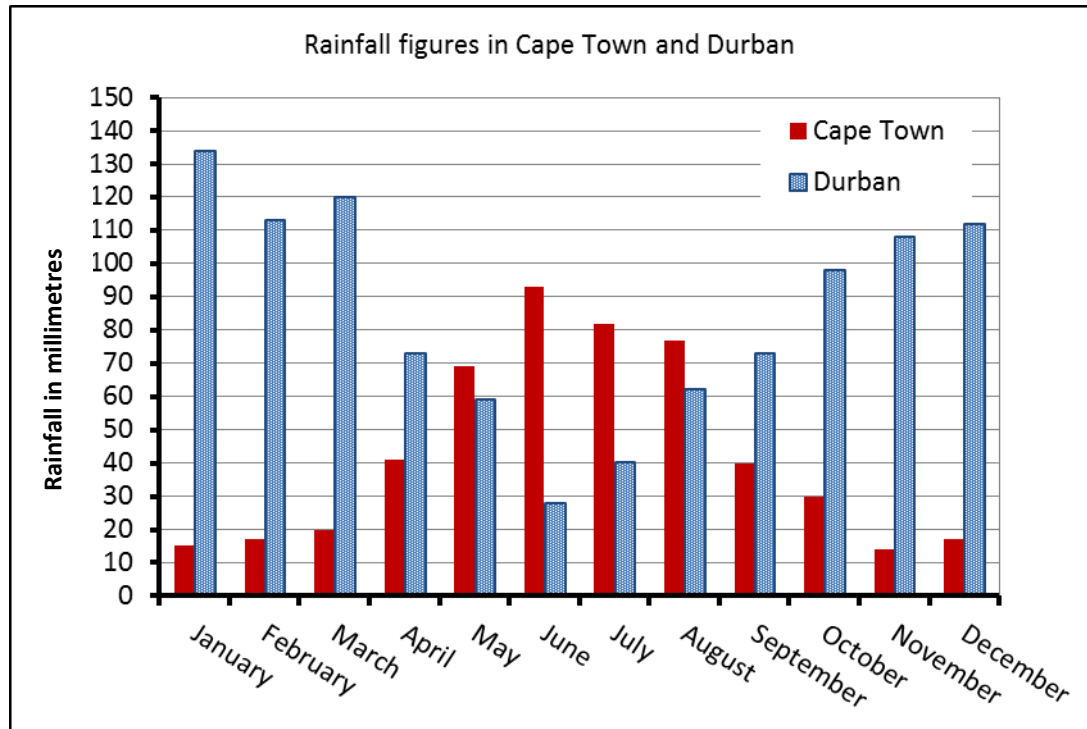
b. The table below shows the heights of boys and girls in a class.

Boys	Girls
1,55 m	1,4 m
1,78 m	1,5 m
1,4 m	1,28 m
1,5 m	1,37 m
1,88 m	1,45 m
1,73 m	1,4 m
1,62 m	1,55 m
1,85 m	1,35 m
1,4 m	1,48 m
1,76 m	1,43 m
1,7 m	1,2 m
1,3 m	

- i) Write down the shortest and tallest height of the boys.
- ii) Subtract the shortest height of the girls from the tallest height of the girls. (This difference is called the 'Range').
- iii) The range of boys' heights is more than the range of girls' heights. What does this mean?
- iv) Calculate the mean height of the boys.
- v) The mean height of the girls is approximately 1,4 metres. What does this tell you about the difference in the boys' and girls' heights?

()

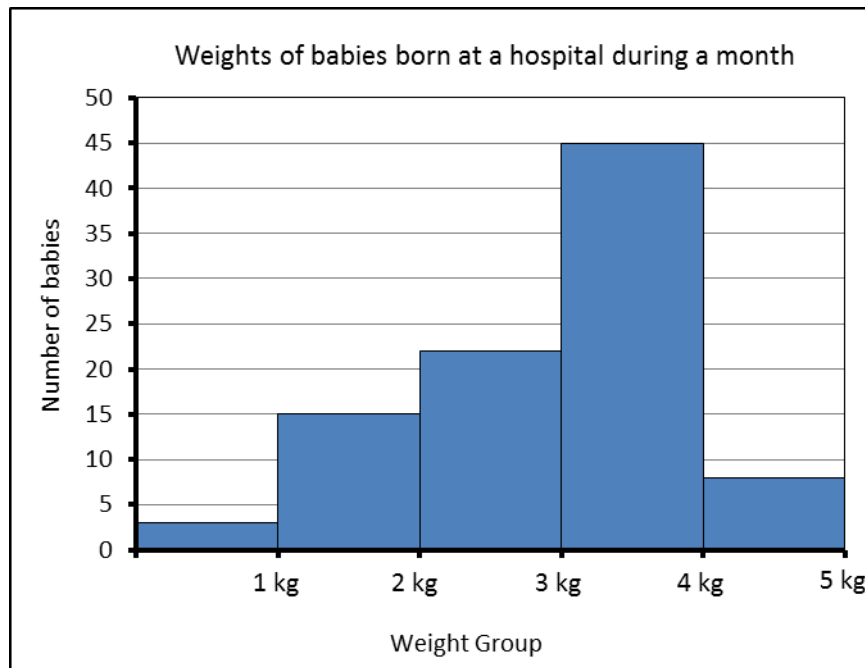
c. Look at the double bar graph below:



- i) Explain how the rainfall pattern in Durban is different to Cape Town.
- ii) If a person wanted to visit Cape Town and spend time outside, in which month would you suggest that they should go? Explain why.
- iii) Will Durban or Cape Town have a higher rainfall 'range' for this year? Explain your answer.

()

d. The graph below is called a histogram.



- i) Describe what information is shown on the graph.
- ii) If a baby weighed 1,5 kg, would it have been included in the 1st, 2nd or 3rd bar?
- iii) How many babies were born weighing between 1 and 2 kilograms?
- iv) How many babies were born weighing less than 1 kilogram?
- v) Which weight group has 22 babies in it?
- vi) Approximately how many babies in total were born during the month?

()

Memo: a. i) 1 mark

ii) 6 marks

iii) The modal mark does not give a clear picture of how most of the learners did in the test. This is because it is lower than most of the other marks. The median mark is much closer to most of the marks and is gives the clearer picture of how the class did as a whole.

b. i) Boys: Shortest = 1,3 m; Tallest = 1,88 m

ii) Range: = 0,35 m (35 cm)

- iii) There is a bigger difference between the shortest and tallest boy than between the shortest and tallest girl. This is because the heights of the boys are more widely spread than the girls; the heights of the girls are more similar.
 - iv) Mean = $19,47 \text{ m} \div 12 = 1,6225 \text{ m}$
 - v) This suggests that there are more boys that are taller than the girls.
- c. i) In Durban there is high rainfall at the beginning and end of the year (in the summer months) and low rainfall in the middle of the year (in the winter months).
- In Cape Town the opposite happens – there is low rainfall in the beginning and end of the year (in the summer months) and high rainfall in the middle of the year (in the winter months).
- ii) In January, February, November or December because there is less rainfall.
 - iii) Durban has a higher range. This is because the difference between the highest (133 mm) and lowest (29 mm) bar for Durban is bigger than for Cape Town (92 mm and 12 mm).
- d. i) The weights of the babies born at a hospital during a year, organised according to different weight groups.
- ii) 2nd bar (between the 1 kg and 2 kg labels)
 - iii) 15 babies
 - iv) Approximately 3 babies
 - v) Between the 2 kg and the 3 kg
 - vi) 93 babies

5.4 Probability

5.4(3) a. i) Write down all the possible outcomes when a coin is tossed.

ii) Paul tosses a coin several times. The pictures below show the results:



How many times did Paul toss the coin?

iii) How many times did the coin land on heads?

iv) When you toss a coin there is a 50% or 1-in-2 chance that the coin will land on heads. Explain why this is true.

v) If Paul was to toss the coin again, do you think the coin would land on heads or tails? Explain your answer. ()

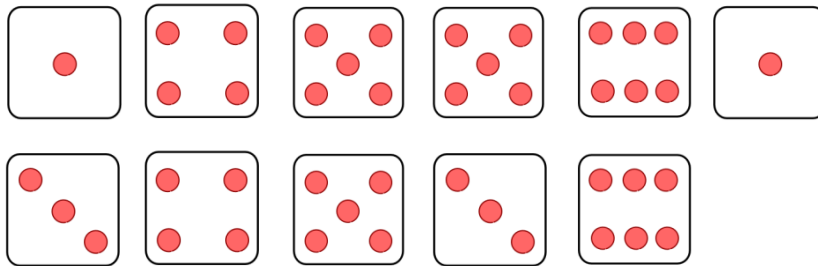
b. i) Write down all of the possible outcomes a six-sided die can land when rolled.

ii) Is it possible for a die to land on 0? Explain your answer.

iii) Is it possible for a die to land on 5? Explain your answer.

vi) Is it possible for a die to land on 7? Explain your answer. ()

- c. Muneeb rolls a fair six-sided die several times. The pictures below show the outcome of the die after every roll.



- How many times did Muneeb roll the die?
- How many times did the die land on 1?
- Which of the possible outcomes did the die not land?
- Which outcome did the die land on the most often?
- Muneeb says that if he was to roll the die again there would be more chance of it landing on 5 than any other number.

Is Muneeb correct? Explain your answer.

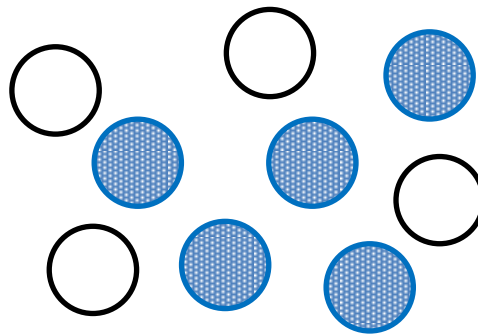
()

Memo

- Heads or tails
 - 10 times
 - 4 times
 - There are only two ways that the coin can land, but the coin can only land on one of these ways every time. This is why there is a 1-in-2 chance, which is the same as 50%.
 - There is no way to predict what the coin will land on because there are always two possible ways that the coin can fall.
- 1, 2, 3, 4, 5, 6
 - No – there is no number 0 on the die.
 - Yes – there is a number 5 on the die.
 - No – there is no number 7 on the die.

- c. i) 11 times
- ii) 2 times or twice
- iii) 2
- iv) 5
- v) Every time a fair die is rolled there is always an equal chance that the die lands on any of the numbers that appear on the die.

5.4(4) a. The picture shows a group of balls:



If these balls were placed in a bag and you were asked to pick a ball without looking in the bag, do you think you are more likely to pick a clear ball or a shaded ball? Give a reason.

()

- b. If a coin is tossed, do you have more of a chance, less of a chance, or an equal chance that the coin will land on heads, rather than tails?
- c. If a die is rolled, do you have more of a chance, less of a chance, or an equal chance that the die will land on 2, rather than 6?

()

()

- d. A learner rolls a fair die several times and ends up with the following results:

Number of the roll	Outcome on the die
Roll 1	3
Roll 2	2
Roll 3	3
Roll 4	5
Roll 5	1
Roll 6	3
Roll 7	2
Roll 8	6
Roll 9	4
Roll 10	3
Roll 11	1
Roll 12	5

- i) How many times did the learner roll the die?
- ii) Use the results given in the table to complete the following frequency table.

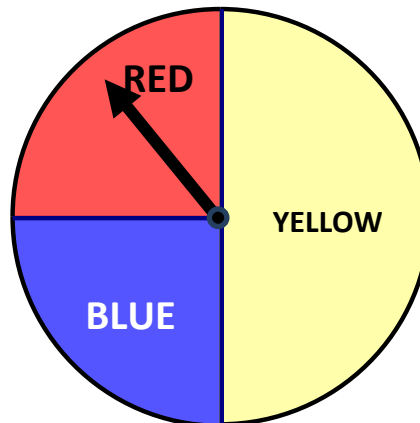
Number on die	Tally	Frequency
1		
2		
3		
4		
5		
6		

- iii) Which number did the die land on most often?
- iv) Which number or numbers did the die land on least often?
- v) In this experiment, the die landed on 3 more often than any other number.

Does this mean that if the learner were to roll the fair die again that it is more likely to get a 3, rather than the other numbers? Explain your answer.

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- e. The picture below shows a fair spinner. The arrow is spun around the circle until it stops on either red, yellow or blue.



- i) How many possible outcomes are there when the arrow is spun?
- ii) If the arrow is spun around the spinner, is there more chance of the arrow landing on the YELLOW, BLUE or RED? Give a reason for your answer.

()

- Memo**
- a. There would be a higher chance of picking the shaded balls because there are more of these balls than clear balls.
- b. Equal chance.
- c. Equal chance.
- d. i) 12 times

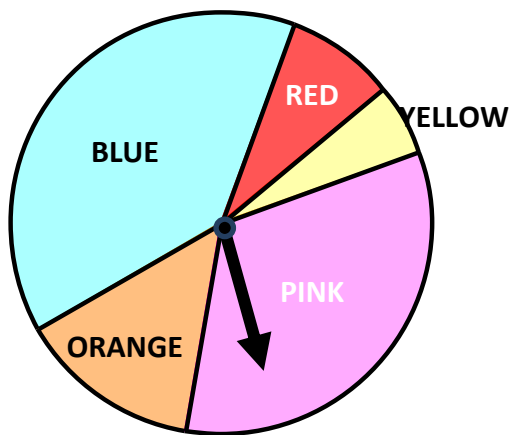
ii)

Number on die	Tally	Frequency
1		2
2		2
3		4
4		1
5		2
6		1

- iii) Number 3
- iv) Numbers 4 and 6
- v) No – every time the die is rolled there is always an equal chance of the die landing on any of the numbers.

- e. i) Three colours.
- ii) Yellow segment – it is bigger than the other two segments.

5.4(4) A learner spins the arrow shown on this fair spinner 20 times. They then record the information in a table that is shown below.



Spin Number	Result
Spin 1	Yellow
Spin 2	Pink
Spin 3	Orange
Spin 4	Blue
Spin 5	Blue
Spin 6	Blue
Spin 7	Pink
Spin 8	Red
Spin 9	Orange
Spin 10	Blue
Spin 11	Pink
Spin 12	Blue
Spin 13	Pink
Spin 14	Orange
Spin 15	Pink
Spin 16	Blue
Spin 17	Red
Spin 18	Pink
Spin 19	Blue
Spin 20	Blue

a. Use the information to complete the following frequency table:

Result	Tally	Frequency
RED		
YELLOW		
PINK		
ORANGE		
BLUE		

- b. Which colour did the arrow land on most often?
- c. Why did the arrow land on this segment most often?
- d. Why did the arrow land on PINK more than ORANGE?
- e. If you had to spin the arrow and make a prediction about which colour the arrow will land on, which colour would you predict? Give a reason for your choice.

- f. Is it possible to be certain which colour the arrow will land on? Explain your answer.

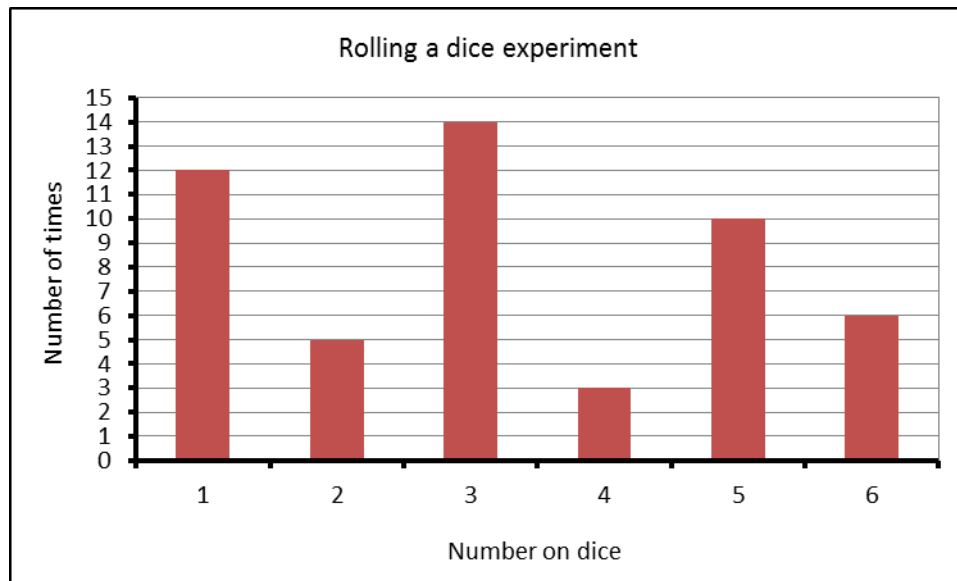
()

Memo

- a.
- | Result | Tally | How many times? |
|--------|-------|-----------------|
| Red | | 2 |
| Yellow | | 1 |
| Pink | | 6 |
| Orange | | 3 |
| Blue | | 8 |
- b. BLUE
- c. This is the biggest segment in the spinner.
- d. The PINK segment is bigger than the ORANGE segment, so there is more space for the arrow to stop on PINK, which makes it more likely to land on.
- e. Either BLUE or PINK because these are the two biggest segments on the spinner.
- f. No. Although we can predict where it is more likely to land, it is not certain to land on the most likely outcome.

5.4(6)

- a. A learner conducts an experiment where they roll a die several times. The bar graph below shows the results of the experiment.



- i) How many times did the die land on the number 1?
- ii) Which number did the die land on 6 times?
- iii) How many times did the learner roll the die in total?
- iv) Which number did the die land on the most number of times?
- v) Which number did the die land on the least number of times?
- vi) If the learner were to conduct this experiment again would they get exactly the same results? Explain.

()

- b. A learner rolls a die.

- i) How many possible outcomes are there when the die is rolled?
- ii) How many of these outcomes are the result 3?
- iii) The probability of the die landing on 3 can be written as: $\frac{1}{6}$.

Write down the probability of the die landing on the number 5.

- iv) Write down the probability that a tossed coin lands on heads.

()

- c. The wheel below was played at a school fair. If you choose to play then you spin the wheel.



- i) How many possible outcomes are there when the wheel is spun?
- ii) How many outcomes result in a win?
- iii) Explain how this game has deliberately been designed to make it harder to win than to lose.

()

- Memo:**
- a.
 - i) 12 times
 - ii) 6
 - iii) 50 times
 - iv) 3
 - v) 4
 - vi) No. Each roll of the die is random so the chance of the die landing on any of the outcomes is the same for each outcome.
 - b.
 - i) 6 possible outcomes
 - ii) Only one
 - iii) $\frac{1}{6}$
 - iv) $\frac{1}{2}$

- c.
 - i) 7 possible outcomes
 - ii) 2 results
 - iii) There are more losing segments than winning segments. And the winning segments are smaller in size than the losing segments.