GR 7 MATHEMATICS REVISION PACK TERM 3

GET DIRECTORATE

NUMERIC AND GEOMETRIC PATTERNS:

Question 1

Circle the correct **LETTER:**

1.1 What is the next term in this pattern: 500, 250, 125, …

A. 100

B. 62.5

C. 75

D. 50 /1/

1.2 Find the 10th term in the sequence. 3, 7, 11 …

A. 31

B. 29

C. 39

D. 19 /1/

1.3 What is the next term in the pattern. 12,5; 25; 37,5; 50 …

A. 62,5

B. 72,5

C. 13

D. 75 /1/

1.4 Find the next term in the following sequence. $\frac{1}{48}, \frac{1}{24}, \frac{1}{12}, \frac{1}{6}, \ldots$

A. $\frac{2}{3}$

B. $1\frac{1}{3}$

C. $\frac{1}{3}$

D. $1\frac{2}{3}$ /1/

1.5 What is the 12th term in the following sequence? 1, 4, 9, …

A. 132

B. 81

C. 144

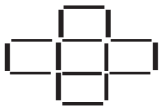
D. 121 /1/ [5]

Question 2

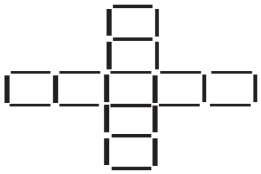
Study the pattern below and answer the questions.

A grade 7 learner at West Port Primary School made the following pattern with match sticks.

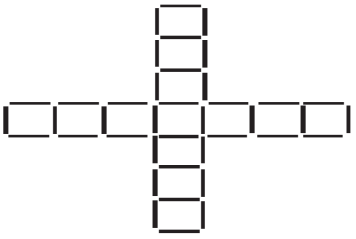
Shape 1



Shape 2



Shape 3



2.1 Explain how the pattern is formed? /1/

2.2 How many matches are needed for shape 5. Explain. /2/

2.3 Complete the table:

Shape no. (n)	1	2	3	4	5	6	10	50
# Matches								

/2/

2.4 Develop a rule to find the number of matches for any shape in the pattern? /1/

2.5 Mr Reddy pays a fee to park his car in a parking lot every day. He must pay R4 to enter the parking lot and then a further R3 for every hour that he leaves his car there.

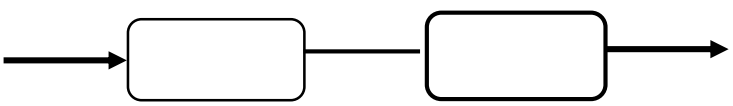
(a) Complete the table below to show how much his parking costs him per day for various numbers of hours.

# hours	1	2	3	4	5	6	7	8	9
Cost of parking in R									

/2/

(b) How did you complete this table? Describe your method. /1/

(c) Complete the following flow diagram. /1/



Question 3

In the pattern below each hexagon is surrounded by dots.

1 2 3

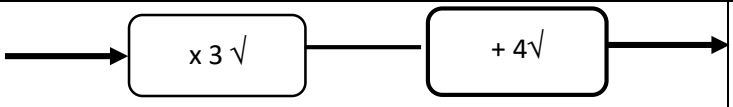
3.1 Find the number of dots in figure 6. Explain the rule. /2/

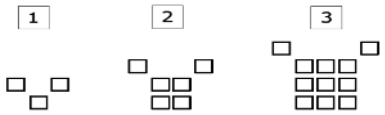
3.2 Find the figure number with 229 dots.
Show how you calculated your answer. /1/

3.3 Create your own pattern by using the following rule $n^2 + 2$.
Draw the first three figures and the table. /2/

[5]

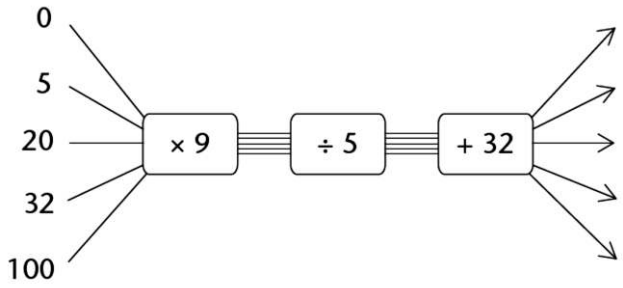
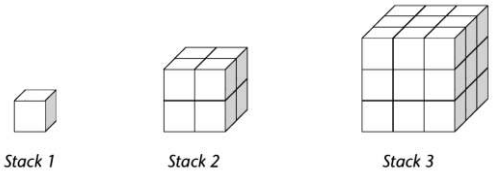
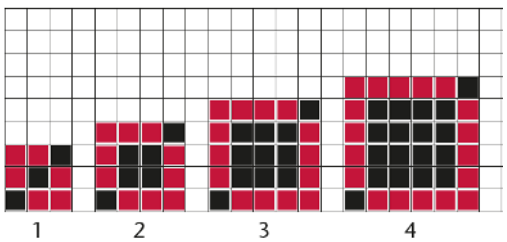
MEMORANDUM / MARKING GUIDELINES

<table>
<tr><th>Questions</th><th>Answers</th><th>Explanations</th><th>Marks</th></tr>
<tr><td>1.1</td><td>B √</td><td>1 mark per correct answer</td><td>1</td></tr>
<tr><td>1.2</td><td>C √</td><td>1 mark per correct answer</td><td>1</td></tr>
<tr><td>1.3</td><td>A √</td><td>1 mark per correct answer</td><td>1</td></tr>
<tr><td>1.4</td><td>C √</td><td>1 mark per correct answer</td><td>1</td></tr>
<tr><td>1.5</td><td>C √</td><td>1 mark per correct answer</td><td>1</td></tr>
<tr><td>2.1</td><td>Learners' own responses</td><td>Use professional judgement</td><td>1</td></tr>
<tr><td rowspan="2">2.2</td><td>64 matches. √</td><td></td><td>1</td></tr>
<tr><td>There are 4 arms and 3 matches are added to each arm of the preceding term = 4 x 3 = 12 and the in the centre has a square made of 4 matches. √</td><td>Use professional judgement</td><td>1</td></tr>
<tr><td>2.3</td><td><table><tr><td>Shape no. (n)</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td></tr><tr><td># Matches</td><td>16</td><td>28</td><td>40</td><td>52</td><td>64</td><td>7</td></tr></table></td><td>All correct entries</td><td>1</td></tr>
<tr><td>2.4</td><td>n x 12 + 4 √</td><td></td><td>1</td></tr>
<tr><td>2.5</td><td><table><tr><td>(a) # hours</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>92</td></tr><tr><td>Parking costs in R</td><td>7</td><td>10</td><td>13</td><td>16</td><td>19</td><td>22</td><td>25</td><td>28</td><td>31</td></tr></table></td><td>All correct entries</td><td></td></tr>
<tr><td></td><td>(b) Learners' own responses</td><td>Use professional judgement</td><td>1</td></tr>
<tr><td></td><td>(c) 
</td><td>For both answers 1 mark</td><td>1</td></tr>
<tr><td>3.1</td><td>figure 6: 12 + 16 + 21 + 26 + 31 + 36√ = 142 dots</td><td></td><td>1</td></tr>
<tr><td>3.2</td><td>Figure 8: 12 + 16 + 21 + 26 + 31 + 36 + 41 + 46 √ = 229dots√</td><td></td><td>1</td></tr>
</table>

<table>
<tr>
<td>3.3</td>
<td>


<table>
<tr><td>Figure</td><td>1</td><td>2</td><td>3</td></tr>
<tr><td>Term</td><td>3</td><td>6</td><td>11√</td></tr>
<tr><td>Calculation</td><td>1x1+2</td><td>2x2+2</td><td>3x3+2√</td></tr>
</table>
</td>
<td>1 mark for the figures and I mark for the table</td>
<td>2</td>
</tr>
</table>

FUNCTIONS AND RELATIONSHIPS:

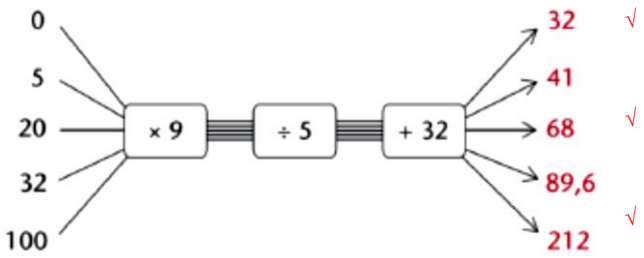
No	Problem/ Sum	Marks
1.	Complete the flow diagram below.  	5
2.	The pattern below shows stacks of building blocks. The number of blocks in each stack is dependent on the number of the stack.  Complete the table below to represent the relationship between the number of blocks and the number of the stack. Stack number | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 Number of blocks | 1 | 8 | | | | | |	6
3.	Complete the tables using the given formulae. $y = 30 \times x + 1$ x | 0,1 | 0,2 | 0,3 | 0,4 | 0,5 | 0,6 | 0,7 y | | | | | | |	7
4.	Which of the formulae below can be used to calculate the numbers of black squares in the arrangements? $z = (x + 2)2$ $z = x2 + 2$ $p = n2 + 2$  	2

10 MARKS

INFORMAL ASSESSMENT - MEMORANDUM

No	Problem/ Sum	Marks

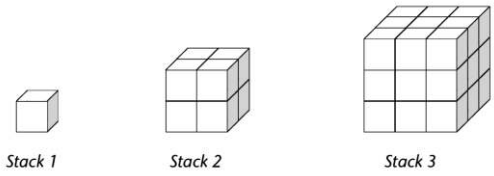
1. Complete the flow diagram below.



√ √ √

5

2. The pattern below shows stacks of building blocks. The number of blocks in each stack is dependent on the number of the stack.



Complete the table below to represent the relationship between the number of blocks and the number of the stack.

6

Stack number	1	2	3	4	5	6	7	8
Number of blocks	1	8	27	64	125	216	343	512

√ √ √ √ √ √

3. Complete the tables using the given formulae.

$y = 30 \times x + 1$

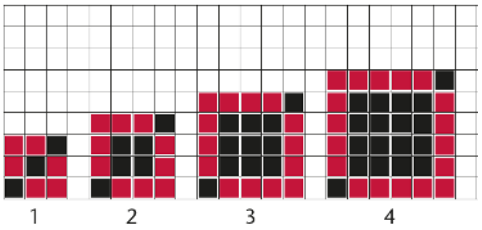
x	0,1	0,2	0,3	0,4	0,5	0,6	0,7
y	4	7	10	13	16	19	22

√ √ √ √ √ √ √

7

4. Which of the formulae below can be used to calculate the numbers of black squares in the arrangements?

$z = (x + 2)2$ $z = x2 + 2$ $p = n2 + 2$



2

$z = x2 + 2$ en $p = n2 + 2$

$= (1 \times 1) + 2$ √

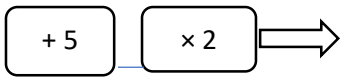
$= 1 + 2$

$= 3$ √

10 MARKS

ALGEBRAIC EXPRESSIONS:

Question 1: Circle the correct letter.



A. Multiply the input number by 4 and then add 3

B. Add 24 to the input number.

C. Add 5 to the input number and then multiply by 2

Question 2:

Copy and complete this table for the rules given in each.

x	**20**	**30**	**40**	**50**	**60**
$5x - 20$					
$20 - 5x$					
$5(x - 20)$					
$3x - 18$					
$5(x - 4)$					
$9x + 10 - 4x - 30$					

Question 3:

Which of these rules do you think will produce the same output numbers?

A: $5\,x - 20$

B: $20 - 5\,x$

C: $5(x - 20)$

D: $3\,x - 18$

E: $5(x - 4)$

F: $9\,x + 10 - 4\,x - 30$

Question 4:

Different values for x are given in the first row of the table below. Write the additive inverses of the x values in the second row and then complete the table.

x	**3**	**2**	**1**	**0**	**-1**	**-2**	**-3**
$-x$							
$5 + (-x)$							
$5 - (-x)$							
$5 - x$							
$5 + x$							

Question 5:

Copy and complete the table below. Note that $(-10\,x)$ indicates the additive inverse of $10\,x$.

x	**1**	**2**	**3**	**4**	**-4**	**-3**	**-2**
$10x + (-1\,000)$							
$(-10x) - 1\,000$							
$1\,000 + (-10\text{x})$							
$1\,000+10\,x$							
$10x - (+1\,000)$							

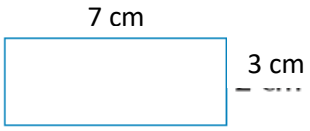
MEMORANDUM

<table>
<tr><th>iTEMS</th><th>ANSWERS /ANTWOORDE</th><th>EXPLANATIONS/
VERDUIDELIKINGS</th></tr>
<tr><td>1</td><td>C</td><td></td></tr>
<tr><td>2</td><td>
<table>
<tr><th>20</th><th>30</th><th>40</th><th>50</th><th>60</th></tr>
<tr><td>80</td><td>130</td><td>180</td><td>230</td><td>280</td></tr>
<tr><td>-80</td><td>-130</td><td>-180</td><td>-230</td><td>-280</td></tr>
<tr><td>0</td><td>50</td><td>100</td><td>150</td><td>200</td></tr>
<tr><td>42</td><td>72</td><td>102</td><td>132</td><td>162</td></tr>
<tr><td>80</td><td>130</td><td>180</td><td>230</td><td>280</td></tr>
<tr><td>80</td><td>130</td><td>180</td><td>230</td><td>280</td></tr>
</table>
</td><td>5 x x – 20
$x\ is\ 20$
e.g $5 \times 20 = 100$
Subtract 20 from the 100 which = 80
Use substitution : $x\ is\ 30$
e.g $5 \times 30 = 150$
Subtract 20 from the 150 which = 130</td></tr>
<tr><td>3</td><td>A: $5x - 20$
E: $5(x - 4)$
F: $9x + 10 - 4x - 30$</td><td>Rrefer to the table above to see the same answers for expressions with additive inverse.</td></tr>
<tr><td>4</td><td>
<table>
<tr><th>3</th><th>2</th><th>1</th><th>0</th><th>-1</th><th>-2</th><th>-3</th></tr>
<tr><td>-3</td><td>-2</td><td>-1</td><td>0</td><td>1</td><td>2</td><td>3</td></tr>
<tr><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td></tr>
<tr><td>8</td><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td></tr>
<tr><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td></tr>
<tr><td>8</td><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td></tr>
</table>
</td><td>Expressions with additive inverse.
Subtract positive and negative quantities</td></tr>
<tr><td>5</td><td>
<table>
<tr><th>1</th><th>2</th><th>3</th><th>4</th><th>-4</th><th>-3</th><th>-2</th></tr>
<tr><td>-990</td><td>-980</td><td>-970</td><td>-960</td><td>-1 040</td><td>-1 030</td><td>-1 020</td></tr>
<tr><td>-1 010</td><td>-1 020</td><td>-1 030</td><td>-1 040</td><td>-960</td><td>-970</td><td>-980</td></tr>
<tr><td>990</td><td>980</td><td>970</td><td>960</td><td>1 040</td><td>1 030</td><td>1 020</td></tr>
<tr><td>1 010</td><td>1 020</td><td>1 030</td><td>1 040</td><td>960</td><td>970</td><td>980</td></tr>
<tr><td>-990</td><td>-980</td><td>-970</td><td>-960</td><td>-1 040</td><td>-1 030</td><td>-1 020</td></tr>
</table>
</td><td>Subtract positive and negative quantities</td></tr>
<tr><td></td><td></td><td>Total/ Totaal</td></tr>
</table>

ALGEBRAIC EQUATIONS

1. Pam is 3 times as old as her younger sister, Jane. Jane is 9 years old.
   (a) Write a closed number sentence to show Pam's age.
   ……
   (b) How old is Pam?
   ……

2. A rectangle is shown on the right. Write a closed number sentence to calculate the following:
   (a) the area of the rectangle
   ……



   (b) the perimeter of the rectangle
   ……

3. Seven learners should each receive the same number of sweets. There are 56 sweets in total that they have to share.
   (a) Which equation (number sentence) describes this situation?
   A. $7 + s = 56$ B. $7s = 56$ C. $s - 7 = 56$ D. $s \div 7 = 56$
   (b) How many sweets does each learner get?
   ……

4. Find the value of the **unknown** that makes the equation true in each case:
   (a) $x + 6 = 15$
   (b) $x + 6 = -4$

5. The mass of an empty truck is $1\,680\ kg$. The truck is used to transport cement. Each pocket of cement has a mass of $50\ kg$. The combined mass of the truck and the cement can be calculated by means of the formula: $y = 50 \times x + 1\,680$.
   Use the terms **variable** or **constant** to describe the meaning of each symbol used in the formula.
   (a) y ……
   (b) 50 ……
   (c) x ……
   (d) $1\,680$ ……

6. Compare the following two expressions:

$2x + 3$ and $3x - 1$

Use the values for x = {2; 3; 4; 5} to answer the following questions.

(a) For which value of x is $2x + 3$ equal to $3x - 1$?
(b) For which values of x is $2x + 3$ smaller than $3x - 1$?
(c) For which values of x is $2x + 3$ greater than $3x - 1$?

MEMORANDUM

QUESTIONS

1.

(a) 3 × 9 = p

(b) 3 × 9 = 27 yrs

2.

(a) $A = l \times b = 7 \times 3 = 21\,cm^2$

(b) $P = 2l + 2b = 2 \times 7 + 2 \times 3 = 14 + 6 = 20\,cm$

3.

(a) B

(b) 56 ÷ 7 = 8

4.

(a) $x + 6 = 15$

$9 + 6 = 15$

$x = 9$

(b) $x + 6 = -4$

$(-10) + 6 = -4$

$x = -10$

5.

(a) y = variable

(b) 50 = constant

(c) x = variable

(d) $1\,680$ = constant

6.

(a) by inspection/substitution

If $x = 4$ then $2x + 3 = 3x - 1$

$2 \times 4 + 3 = 3 \times 4 - 1$

$8 + 3 = 12 - 1$

$11 = 11$

(b) by inspection/substitution

If $x = 5$ then $2x + 3 < 3x - 1$

$$2 \times 5 + 3 < 3 \times 5 - 1$$

$$10 + 3 < 15 - 1$$

$$13 < 14$$

(c) by inspection/substitution

If $x = 2$ then $2x + 3 > 3x - 1$

$$2 \times 2 + 3 > 3 \times 2 - 1$$

$$4 + 3 > 6 - 1$$

$$7 > 5$$

If $x = 3$ then $2x + 3 > 3x - 1$

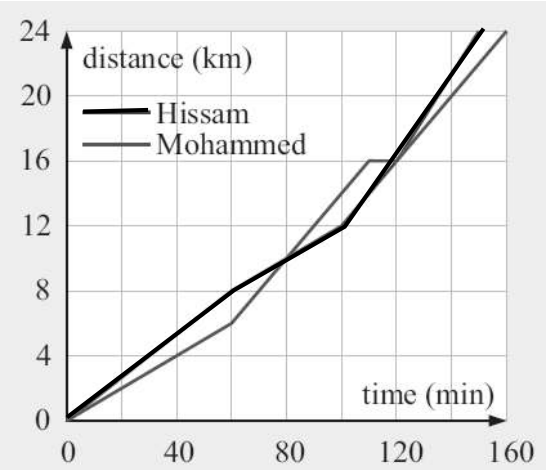
$$2 \times 3 + 3 > 3 \times 3 - 1$$

$$6 + 3 > 9 - 1$$

$$9 > 8$$

GRAPHS: ASSESSMENT

1. Two long distance runners Hissam and Mohammed decided to have a race one afternoon. The distance of each runner from the starting point is shown on the graph.



Use the graph to determine:

a. the distance of the race.

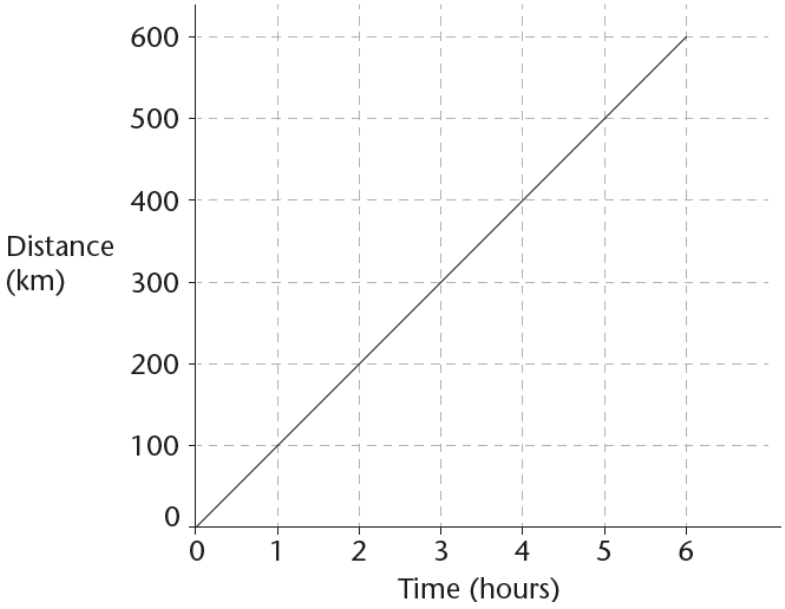
b. who was leading the race after 1 hour.

c. the time at when Mohammed overtook Hissam.

d. how far Mohammed had run before he developed cramp and had to stop and rest.

e. who won the race.

2. Study the following graph, showing the distance travelled by a car on the N1, and then answer the questions that follow:



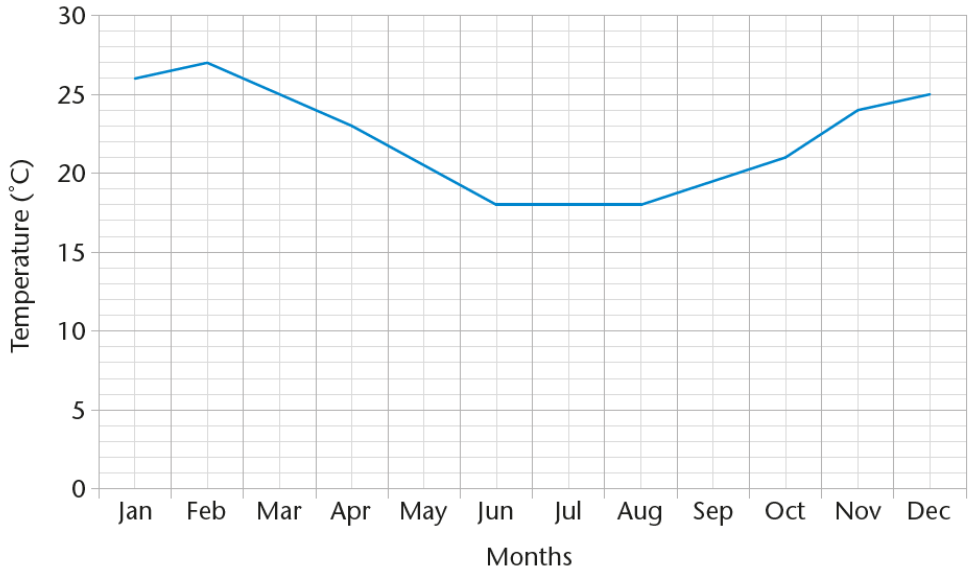
a. Ahmed says: "This is a linear graph." Is he correct? Explain your answer.

b. Sindi says that the graph is increasing. Is she correct? Explain your answer.

c. How far has the car travelled after 1,5 hours?

d. If the car continued in the same way as shown on the graph, how far will it have travelled after 10 hours?

3. Study the following graph, showing the average maximum temperatures in Cape Town, and then answer the questions that follow:



a. Describe the trend in the maximum temperatures from February to June.

b. Describe the trend in the maximum temperatures from June to August.

c. Describe the trend in the maximum temperatures from August to October.

d. Which is the hottest month in Cape Town?

e. What is the average maximum temperature in this month?

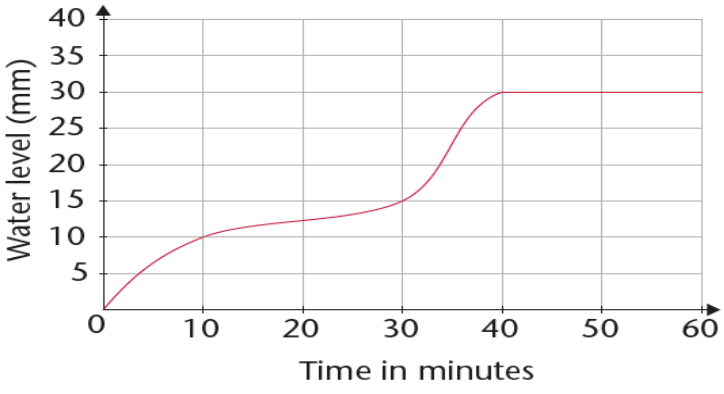
f. Write down the names of the coldest months in Cape Town.

g. What is the average maximum temperature during these months?

4. During a rainstorm, Lydia put a measuring cup outside to measure the rainfall. After 10 minutes of hard rain, the water level was 10 mm. It started to rain softer, and after 20 more minutes the water level was 15 mm. When Lydia went back 10 minutes later, the level was 30 mm. An hour after the storm started, the water level was still 30 mm.

   Draw a graph to indicate her findings.

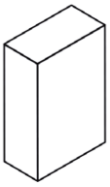
MEMORANDUM OF ASSESSMENT

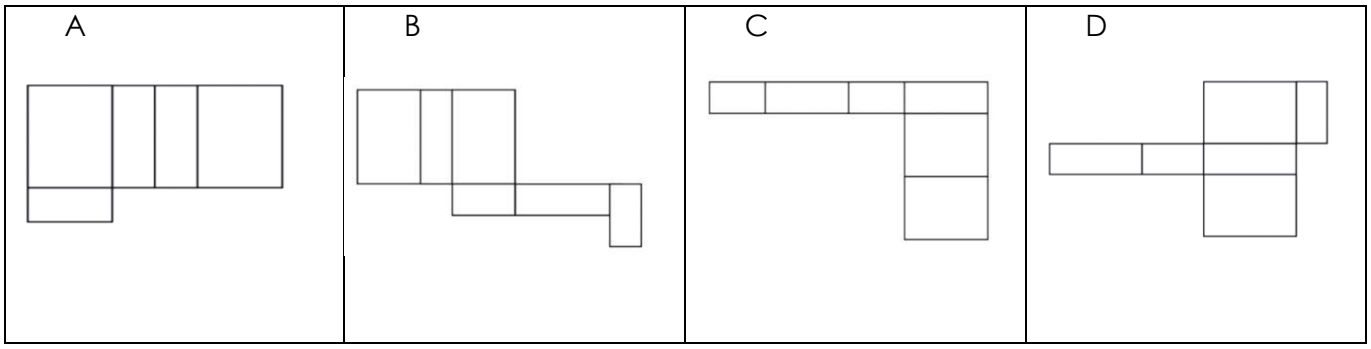
1. a. 24 km b. Hissam c. About 70 minutes d. 16 km e. Hissam	 1 1 1 1 1 [5]
2. a. Yes, because the graph is a straight line. b. Yes, the graph is increasing because the distance (the dependent variable on the vertical axis) increases as the time (the independent variable on the horizontal axis) increases. c. 150 km d. 1 000 km	 1 1 1 1 [4]
3. a. Decreasing b. Constant c. Increasing d. February e. 27 °C f. June, July and August g. 18 °C	 1 1 1 1 1 1 1 [7]
4. 	

One mark for each of the axis and two marks for the graph. For the axis look at the scale and the name of the axis, both must be included for 1 mark. For the graph, 0 – 30 minutes must be correct and the second mark is for 30 – 60 minutes.	[4]

3-D OBJECTS

Which figure can be folded to form the rectangular box?





1. The faces of a pentagonal pyramid consist of:
   A. One pentagon and five triangles
   B. One pentagon and five rectangles
   C. Two pentagons and five rectangles
   D. Two pentagons and five triangles

2. The faces of a square pyramid consist of:
   A. Six squares
   B. Two squares and four rectangles
   C. One square and three triangles
   D. One square and four triangles

3. The faces of a triangular pyramid consist of:
   A. Two triangles and three rectangles
   B. Two rectangles and three triangles
   C. One square and three triangles
   D. Four triangles

4. Which of the following has no rectangular faces?
   A. Triangular pyramid
   B. Triangular prism
   C. Square prism
   D. Cube

5. Which one of the following is NOT a polyhedron?
   A. Cylinder
   B. Cube
   C. Rectangular prism
   D. Pentagonal prism

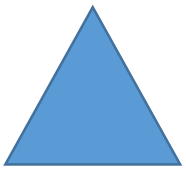
6. A polyhedron has 6 vertices and 8 faces. How many edges does it have?
   A. 12
   B. 14
   C. 16
   D. 18

7. Which of the following objects do NOT have any edges?
   A. Cube
   B. Rectangular prism
   C. Triangular pyramid
   D. Sphere

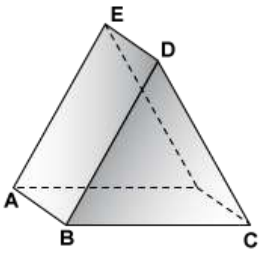
8. Which two mathematical shapes could you combine to make this building?
   A. Cone and sphere
   B. Cylinder and sphere
   C. Cone and cylinder

9. If there are 9 squares on each face of on a Rubik's Cube, how many squares are there in total?
   A. 15
   B. 54
   C. 45
   D. 27

10. If the triangular prism is cut in half, parallel to its base, which 2D shape will be viewed from above?

A. 

B. 



MEMORANDUM:

ACTIVITY 18

1. C
2. A
3. D
4. D
5. D
6. A
7. A
8. D
9. C
10. B
11. B