



basic education

Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

MARKS

ANNUAL NATIONAL ASSESSMENT 2013 GRADE 9 MATHEMATICS TEST

MARKS: 140

TIME: $2\frac{1}{2}$ hours

PROVINCE _____

REGION _____

DISTRICT _____

SCHOOL NAME _____

EMIS NUMBER (9 digits)

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CLASS (e.g. 9A) _____

SURNAME _____

NAME _____

GENDER (✓)

BOY	
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GIRL	
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DATE OF BIRTH

C	C	Y	Y	M	M	D	D
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This test consists of 24 pages, excluding the cover page.

QUESTION 1

1.1 Which ONE of the following numbers is an irrational number?

- A $\frac{-3}{5}$
- B $\sqrt{5}$
- C $0,\dot{3}$
- D $\sqrt[3]{-64}$

1.2 Which number is missing in the number sequence?

$$\frac{1}{3}; \dots; \frac{1}{12}; \frac{1}{24}; \frac{1}{48}$$

- A $\frac{1}{6}$
- B $\frac{1}{8}$
- C $\frac{1}{9}$
- D $\frac{1}{10}$

1.3 The straight line graph defined by $3y + 2x + 1 = 0$ will cut the X-axis at the point ...

- A $(-2; 0)$
- B $(-\frac{1}{2}; 0)$
- C $(-3; 0)$
- D $(-\frac{1}{3}; 0)$

1.4 Given the expression: $\frac{x-y}{3} + 4 - x^2$

Circle the letter of the incorrect statement.

- A The expression consists of 3 terms.
- B The coefficient of x is 1.
- C The coefficient of x^2 is -1.
- D The expression contains 2 variables.

1.5 Complete: $(-3xy^2)^2 =$

- A $-6x^2y^2$
- B $-9x^2y^4$
- C $9x^2y^4$
- D $6x^2y^2$

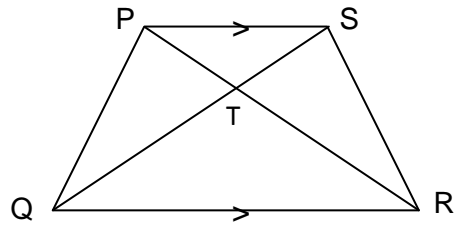
1.6 0,000065 written in scientific notation is:

- A $0,65 \times 10^{-5}$
- B $7,0 \times 10^{-5}$
- C $6,5 \times 10^{-5}$
- D 65×10^{-5}

1.7 Complete: $9^{-1} \div 3^{-1} =$

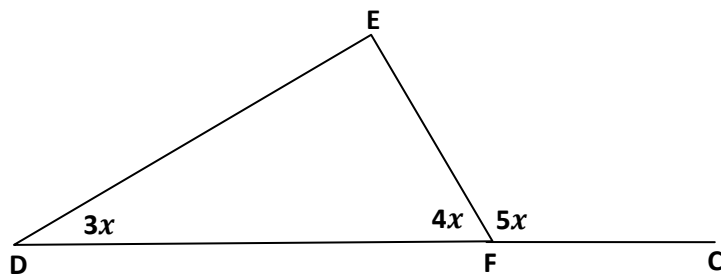
- A 3^2
- B 9
- C 3
- D $\frac{1}{3}$

- 1.8 In the figure below, $PS \parallel QR$. Which ONE of the following statements is true for this figure?



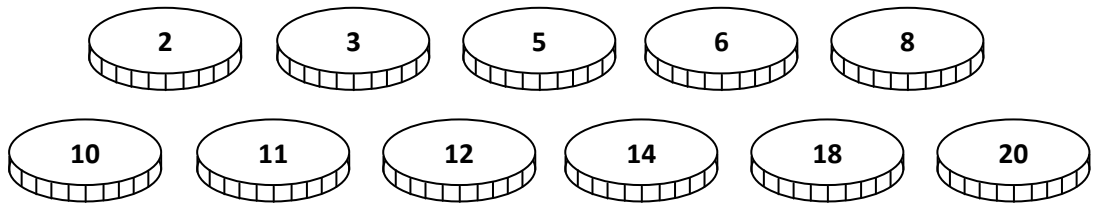
- A $\triangle PTS \cong \triangle PQT$
- B $\triangle PTS \cong \triangle RTQ$
- C $\triangle PTS \sim \triangle SRT$
- D $\triangle PTS \sim \triangle RTQ$

- 1.9 In the figure below, side DF of $\triangle EDF$ is produced to C . Calculate the size of \hat{E} in terms of x .



- A $2x$
- B $12x$
- C $7x$
- D $9x$

1.10



The above discs are placed into a bag. What is the probability of taking out a disc marked with a number that is a multiple of 4?

- A $\frac{1}{11}$
- B $\frac{8}{11}$
- C $\frac{4}{11}$
- D $\frac{3}{11}$

[10]

QUESTION 2

Simplify each of the following expressions:

2.1 $\frac{6x^5}{x^4} - \frac{15x^3}{3x^2}$

(3)

2.2 $x(x+2) - (x-1)(x-3)$

(4)

2.3 $\sqrt{225x^4} - \sqrt[3]{125x^6}$

(5)

2.4 $\frac{2x+1}{4} - \frac{x+2}{2} - \frac{1}{4}$

(4)
[16]

QUESTION 3

Factorise fully:

3.1 $6a^3 - 12a^2 + 18a$

(2)

3.2 $7x^2 - 28$

(2)
[4]

QUESTION 4

Solve for x :

4.1 $3x - 1 = 5$

(2)

4.2 $2(x - 2)^2 = (2x - 1)(x - 3)$

(4)

4.3 $\frac{2x-3}{2} + \frac{x+1}{3} = \frac{3x-1}{2}$

(4)

4.4 $x^3 = 64$

(2)
[12]

QUESTION 5

5.1 Write down the next TWO terms in the number sequence 7; 11; 15;

_____ (2)

5.2 Write down the general term T_n of the above number sequence.

$T_n =$ _____ (2)

5.3 Calculate the value of the 50th term.

(2)
[6]

QUESTION 6

6.1 How long will it take to travel 432 kilometres at an average speed of 96 kilometres per hour?

(2)

6.2 Calculate the simple interest on R3 500 invested at 6% per annum for 3 years.

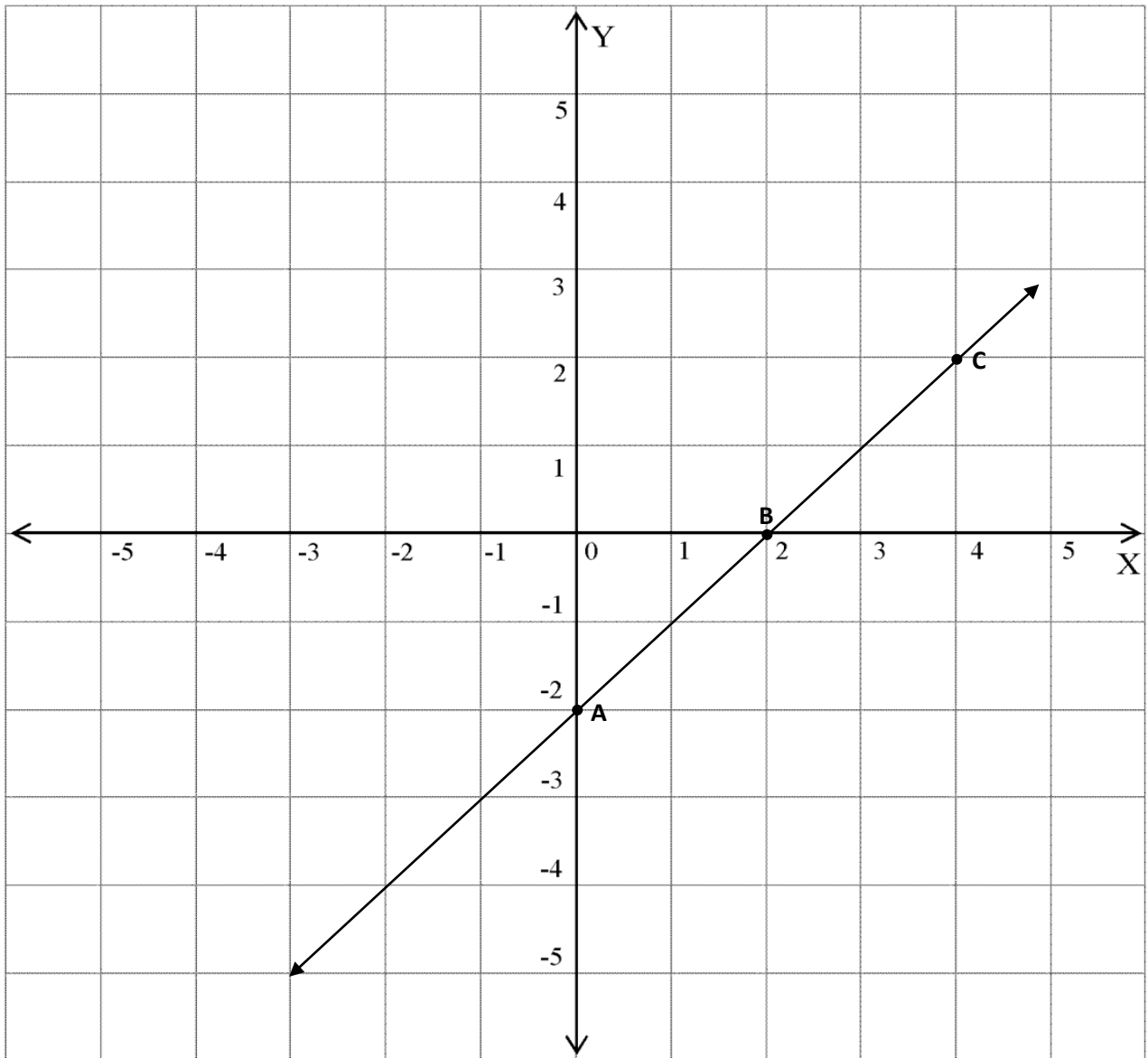
(5)

6.3 Calculate how much money you will owe the bank after 3 years if you borrow R7 500 from the bank at 13% per annum compound interest.

(4)
[11]

QUESTION 7

7.1 Use the graph below to answer the questions that follow.



7.1.1 Write down the coordinates of points A, B and C in the table.

	A	B	C
x-coordinate			
y-coordinate			

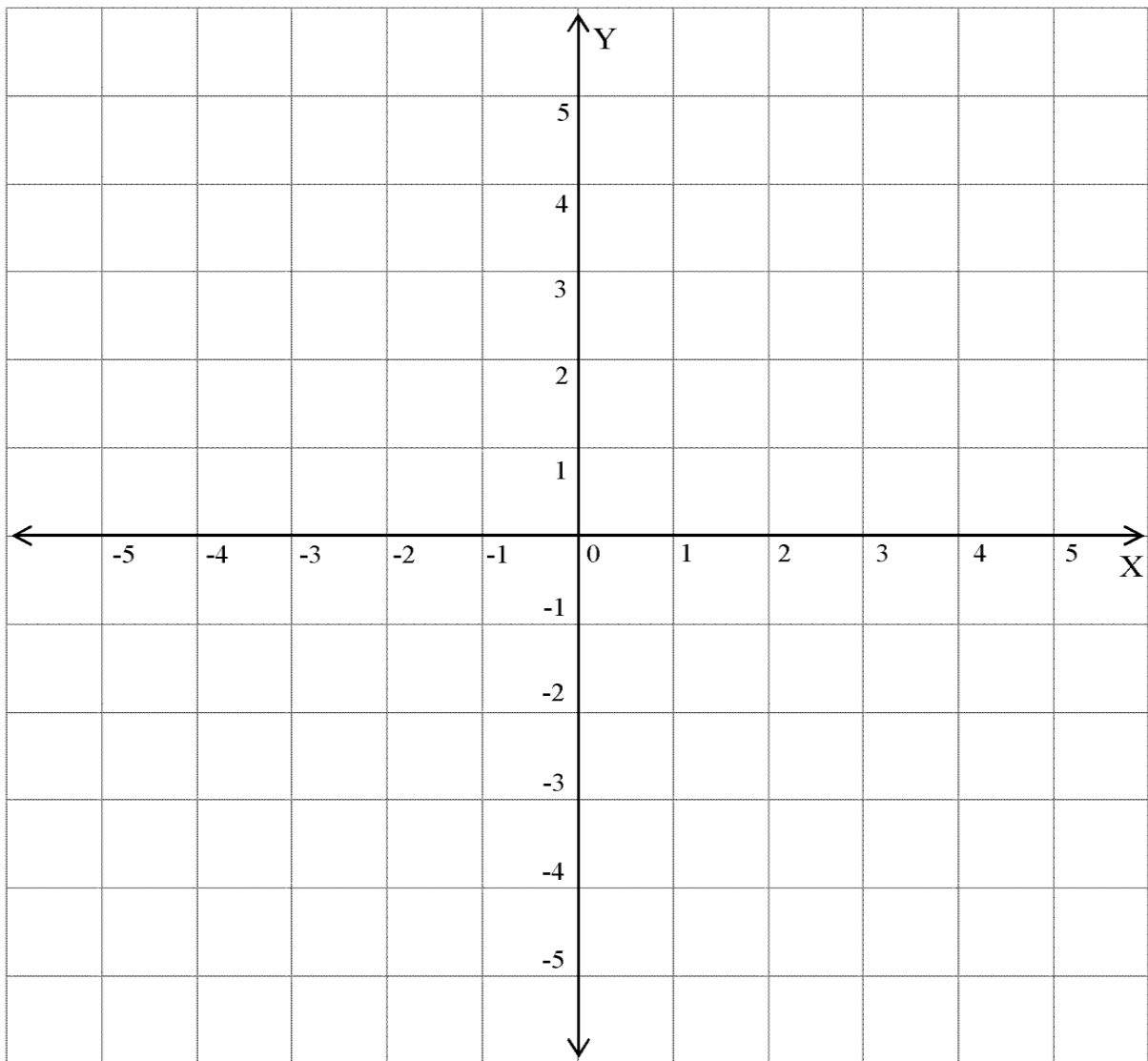
(3)

7.1.2 Use the table in question 7.1.1 or any other method to determine the equation of line ABC.

(2)

7.2 Use the grid below to answer the questions that follow.

7.2.1 Draw the graphs defined by $y = -2x + 4$ and $x = 1$ on the given set of axes. Label each graph and clearly mark the points where the lines cut the axes.



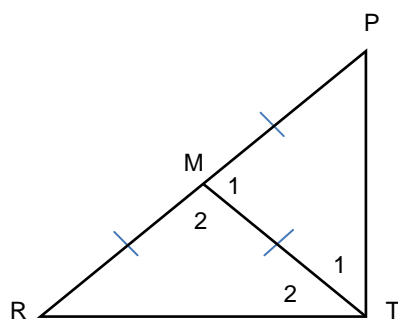
(5)

7.2.2 Write down the coordinates of the point where the two lines cut one another.

(2)
[12]

QUESTION 8

8.1 In $\triangle PRT$ below, M is the midpoint of PR and $MR = MT$.



If $\hat{P} = 25^\circ$, calculate with reasons:

8.1.1 The size of \hat{T}_1

(1)

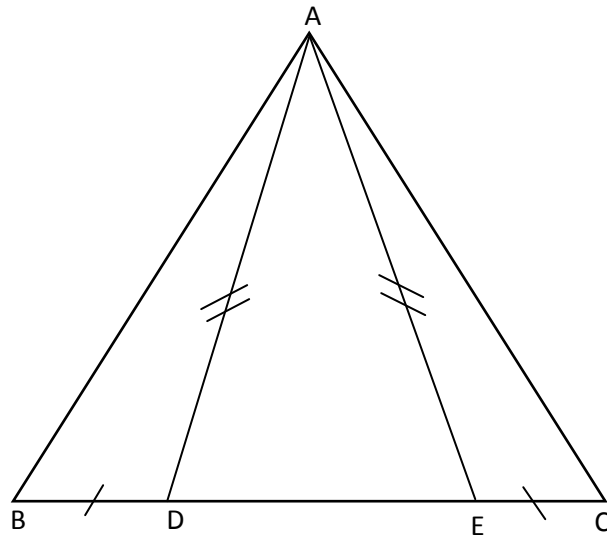
8.1.2 The size of \hat{M}_2

(1)

8.1.3 The size of \hat{R}

(3)

8.2 In $\triangle ABC$, D and E are points on BC such that $BD = EC$ and $AD = AE$.



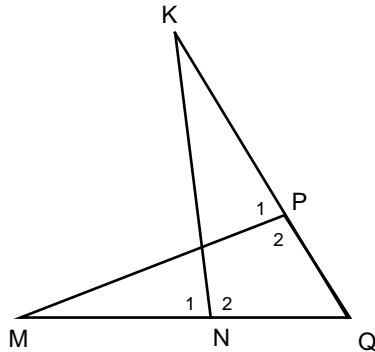
8.2.1 Why is $BE = CD$?

(1)

8.2.2 Which triangle is congruent to $\triangle ABE$?

(1)

- 8.3 In the figure below $\triangle KNQ$ and $\triangle MPQ$ have a common vertex Q .
 P is a point on KQ and N is a point on MQ .
 $KQ = MQ$ and $PQ = QN$.

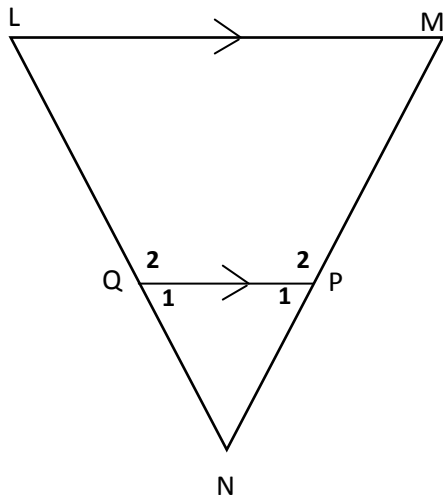


Prove with reasons that $\triangle KNQ \cong \triangle MPQ$.

(4)

8.4 In $\triangle NML$ below, P and Q are points on the sides MN and LN respectively such that $QP \parallel LM$.

$MN = 16$ cm, $QP = 3$ cm and $LM = 8$ cm.



8.4.1 Complete the following (give reasons for the statements):

Prove with reasons that $\triangle QPN \parallel \triangle LMN$.

In $\triangle QPN$ and $\triangle LMN$

1. $\hat{N} = \dots\dots\dots$

2. $\hat{P}_1 = \dots\dots\dots$

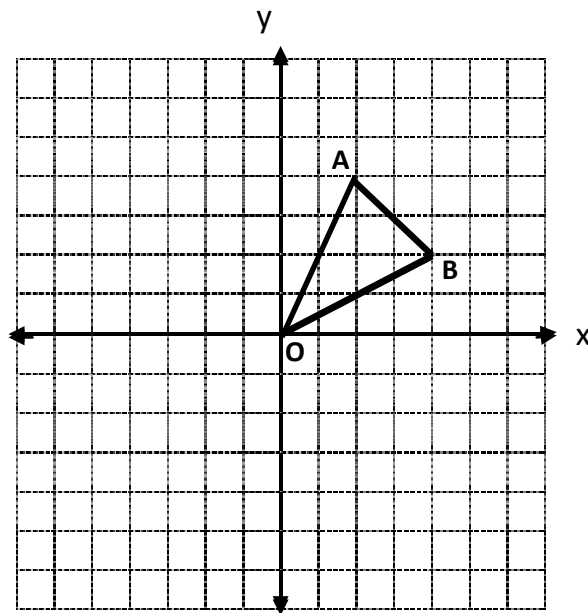
3. $\hat{Q}_1 = \dots\dots\dots$

$\therefore \triangle QPN \parallel \triangle \dots\dots\dots$ (4)

8.4.2 Hence, calculate the length of PN .

(3)
[18]

QUESTION 9

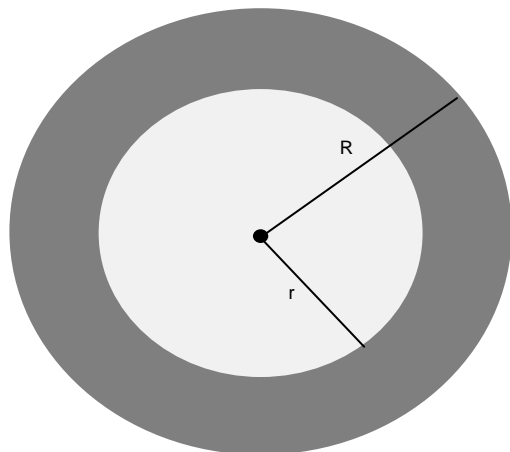


- 9.1 Use the given grid to draw $\Delta A'OB'$, the reflection of ΔAOB in the X-axis. (2)
- 9.2 Write down the coordinates of B' , the image of B . (1)
- 9.3 On the same grid, draw the rotation of ΔAOB through 180° about the origin to form $\Delta A''OB''$. (2)
- 9.4 Hence, determine the length of $A'A''$. (1)

[6]

QUESTION 10

10.1



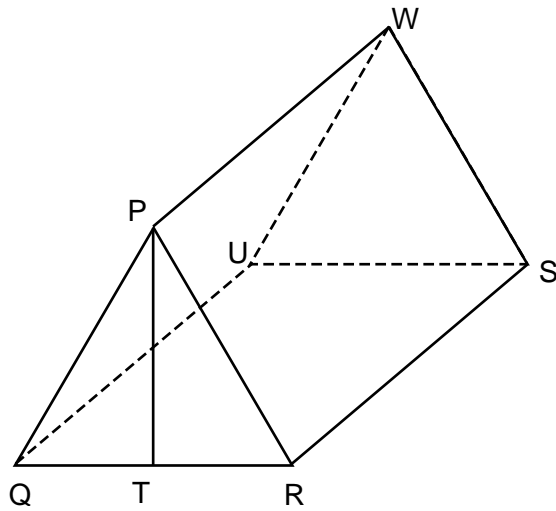
10.1.1 Show that the area of the shaded ring is equal to $\pi(R^2 - r^2)$.

(2)

10.1.2 Determine the area of the shaded ring in terms of π if
 $R = 14$ cm and $r = 8$ cm.

(2)

10.2 In the triangular prism below, $\Delta PQT \cong \Delta PRT$, $PQ = PR$ and $PT \perp QR$.



10.2.1 Determine the length of QT if $QR = 48$ cm. (Give a reason for your answer).

_____ (2)

10.2.2 If $PQ = PR = 25$ cm, show that $PT = 7$ cm.

 _____ (4)

10.2.3 Hence, calculate the area of ΔPQR .

 _____ (3)

10.2.4 Calculate the volume of the prism if $RS = 80$ cm.

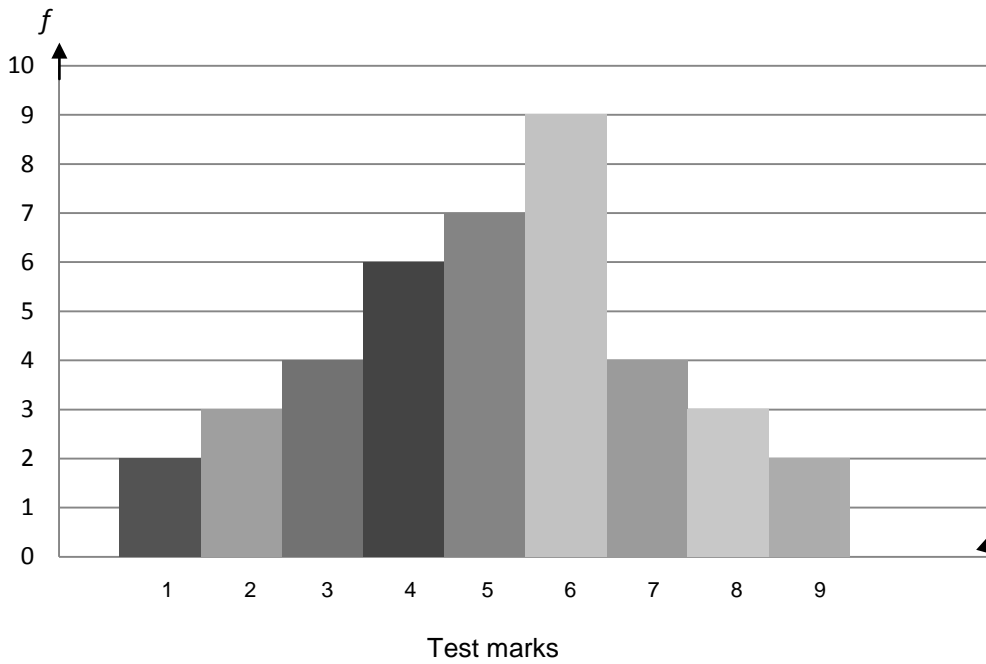
(2)

10.2.5 Calculate the surface area of the prism.

(5)
[20]

QUESTION 11

The histogram below illustrates the Mathematics test marks, out of 10, obtained by a Grade 9 class.



11.1 Complete the frequency table for the given histogram.

Mark	Frequency	Product
x	f	$f.x$
1	2	2
2		

(4)

11.2 How many learners were tested?

(1)

11.3 Calculate the mean test mark.

The mean mark = _____

= _____

= _____

(3)

11.4 What percentage of the learners obtained 7 or more out of 10 for the test?

(2)

[10]

QUESTION 12

The following are the heights, in centimetres, of a group of Grade 9 learners.

156	147	173	165	170
145	153	165	149	158
163	156	153	157	137
177	146	150	153	158

12.1 Draw a stem-and-leaf plot to illustrate the data.

Stem	Leaves
13	
14	
15	
16	
17	

(5)

12.2 Use the data to complete each of the following:

12.2.1 The range = _____ . (1)

12.2.2 The mode = _____ . (1)

12.2.3 The median = _____ . (1)

12.2.4 The number of learners who are shorter than 160 cm = _____ . (1)

[9]

QUESTION 13

A box contains 3 blue, 4 white and 5 green marbles of the same size.

13.1 If you take out 1 marble, what is the probability that you will take out a green marble?

_____ (1)

13.2 What is the probability of then taking out a white marble if you replace the marble that you took out of the box previously?

_____ (1)

13.3 If you take out a white marble and do not replace it, what is the probability of taking out another white marble?

_____ (1)
[3]

QUESTION 14

The 200 Grade 9 boys in a school play soccer, hockey or both. If 150 boys play soccer and 130 play hockey, calculate how many of them play BOTH soccer and hockey.

_____ (3)
[3]

TOTAL: 140