GAUTENG PROVINCE
EDUCATION
REPUBLIC OF SOUTH AFRICA

GAUTENG DEPARTMENT OF EDUCATION

PROVINCIAL EXAMINATION

NOVEMBER 2017

GRADE 9

MATHEMATICS

NAME OF LEARNER: _____

GRADE: _____

TIME: 2 hours

MARKS: 100

18 pages + 1 formula sheet

P.T.O.

INSTRUCTIONS AND INFORMATION

Read the following instructions carefully before answering the questions.

1. This question paper consists of 8 questions and 19 pages, including the attached FORMULA SHEET.

2. Answer ALL questions.

3. A non-programmable calculator may be used unless otherwise stated.

4. Clearly show all calculations, diagrams and graphs that you have used in determining your answers. Answers only will not necessarily be awarded full marks.

5. If necessary, round-off answers to 2 decimal places, unless otherwise stated.

6. Diagrams are not necessarily drawn to scale. Reasons MUST always be given when doing geometry calculations.

7. Number your answers correctly according to the numbering system used in this question paper.

8. Answer Questions 2 to 8 in the spaces provided.

9. Write neatly and legibly.

QUESTION 1 **[10]**

Answer the following questions by choosing the correct answer. Circle the LETTER of the correct answer.

1.1 Perpendicular lines are two straight lines that form a _____ angle when they meet or intersect each other.

A 180°

B 360°

C 90°

D 45° (1)

1.2. $\frac{(ab^2c)^3(2a^2)^2}{2a^5(b^3c^2)^2}$

A $\frac{2a^2}{2}$

B $\frac{4ab}{c^2}$

C $\frac{2ab}{c^2}$

D $\frac{2a^2}{c}$ (1)

1.3. The next term in the pattern 7; 1; -5; -11 will be:

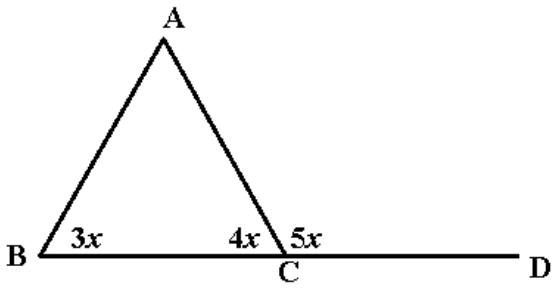
A 17

B -17

C -22

D 16 (1)

1.4 In ΔABC, BC is produced to D. The size of A in terms of x is…



A $2x$

B $12x$

C $7x$

D $9x$ (1)

1.5 Which of the following numbers is irrational?

A $0, 2$

B $0,\dot{5}$

C $\sqrt{5}$

D $\sqrt{6\frac{1}{4}}$ (1)

1.6 A circle has a diameter of 6 cm. The area of a quarter circle is___ cm^2.

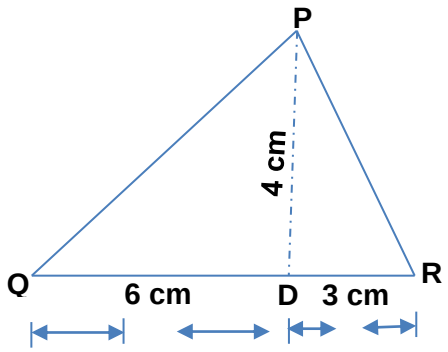
A 36π

B 9π

C $\frac{9}{4}\pi$

D $\frac{9}{2}\pi$ (1)

1.7 The perimeter of the following figure in cm is:



A 20 cm

B 21,21 cm

C 9 cm

D 5 cm (1)

1.8 Bonga covers a distance of 3,375 km in 45 minutes. The speed she travels at will be:

A 60 km/h

B 4,5 km/h

C 120 km/h

D 2,53 km/h (1)

1.9 The straight line graph defined by $y = 2x - 4$ will cut the y-axis at:

A (0;4)

B (-4;2)

C (0;-4)

D (2; -4) (1)

1.10 In a bag there are 8 red balls, 6 blue balls, 2 white balls and 4 green balls. The percentage probability of drawing a red ball is:

A 80%

B 60%

C 40%

D 20% (1)

QUESTION 2 **[20]**

2.1 Simplify the following:

2.1.1 $\frac{1}{2}(a+b)-4a\left(\frac{1}{4}\right)-b$

(3)

2.1.2 $\frac{4}{x-5}+\frac{3}{x-2}$

(3)

2.1.3 $\frac{x^2+x-2}{x-1}\div\frac{x^2+2x}{4}$

(4)

2.2 Factorise fully:

2.2.1 $24xy - 16x^2y + 8xy^2$

(2)

2.2.2 $x^2(x - 3) - 4(x - 3)$

(3)

2.3 Solve for *x:*

2.3.1 $4(x + 2) = 16 + 2(x - 1)$

(3)

2.3.2 $3^x = \frac{1}{27}$

(2)

QUESTION 3 **[13]**

3.1 Sihle wants to buy a bicycle that costs R799,00. He cannot afford to pay the full amount all at once, so the seller allows him to pay R79,90 now as a deposit and pay the rest over 3 years at 20% p.a.

3.1.1 Calculate the amount that he still needs to pay, after he has paid the deposit.

_____

_____

_____ (1)

3.1.2 What interest amount does he need to pay on the remainder?

_____

_____

_____ (3)

3.1.3 What is the total amount that Sihle still has to pay?

_____

_____

_____ (2)

3.1.4 How much must he pay every month for the bike for the next 3 years?

_____

_____

_____ (2)

3.1.5 How much would have been paid altogether for the bicycle at the end of 3 years?

_____

_____

_____ (2)

3.2 Biltong is sold at R21,50 per kilogram. Complete the table below:

Amount of biltong	Amount paid	Change in rands
2 kg	R50,00	R7,00
A	R40,00	R18,50
500 g	**B**	R4,25
3,5 kg	R200,00	**C**

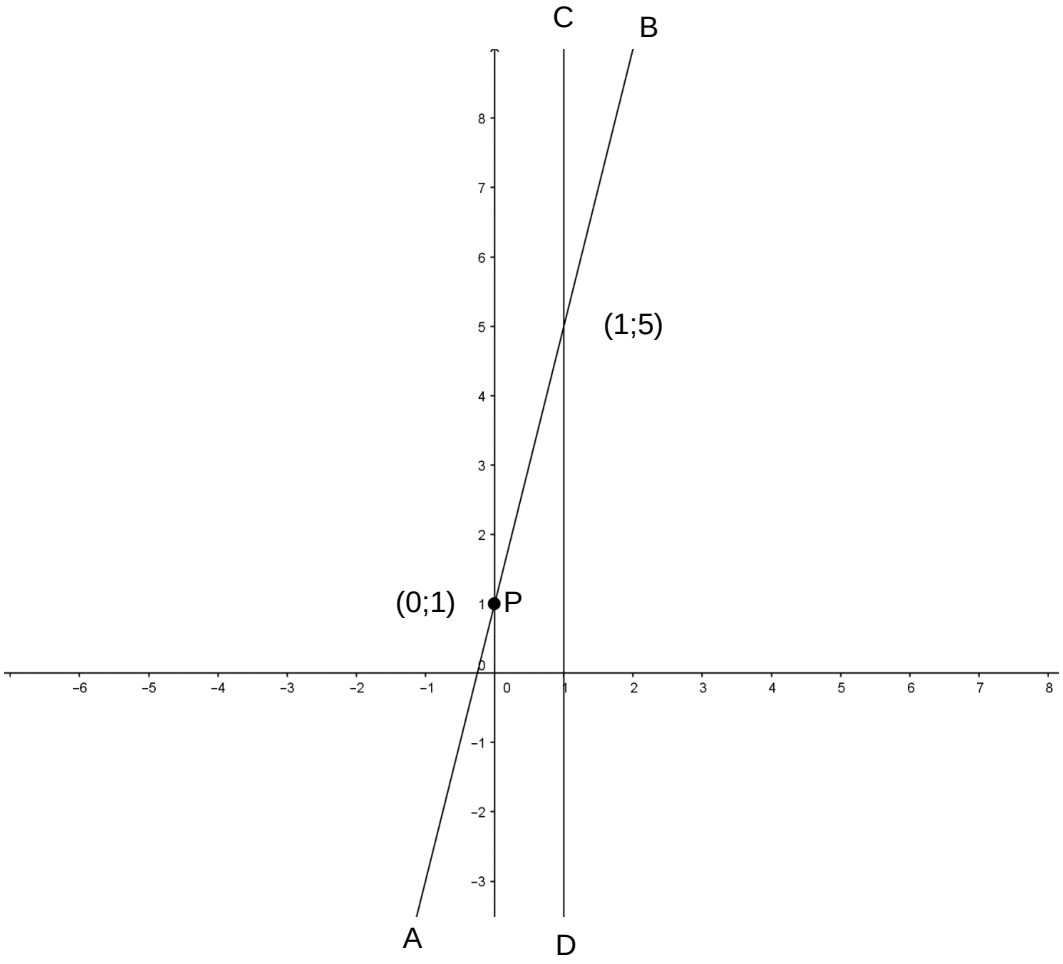
A _____

B _____

C _____ (3)

QUESTION 4 **[4]**

4.1 Study the following graphs and answer the questions that follow.



4.1.1 Calculate the gradient of line AB, you may use the given formula:

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

_____

_____

_____ (2)

4.1.2 Find the equation of line AB in the form: $y = mx + c$.

_____

_____

_____ (2)

QUESTION 5 **[10]**

5.1 Study the diagram pattern below. Complete the table for figures 4 and 5.

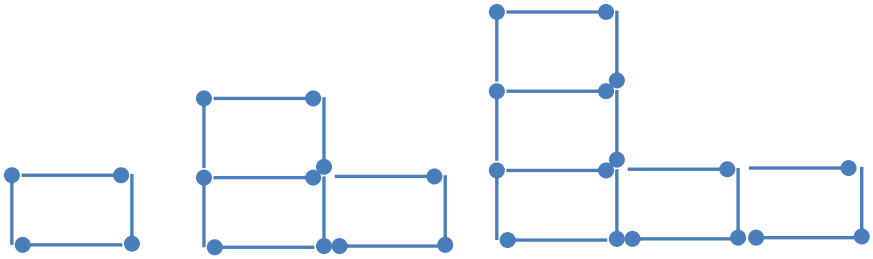


FIGURE 1 **FIGURE 2** **FIGURE 3**

FIGURE	1	2	3	4	5
NUMBER OF MATCHSTICKS	4	10	16		

(2)

5.2 Describe the pattern in your own words.

_____

_____

_____ (1)

5.3 Determine the rule of the pattern in terms of T*n*.

_____

_____

_____ (2)

5.4 Determine the 10^{th} term.

_____

_____

_____ (2)

5.5 Which term of the sequence is equal to 76?

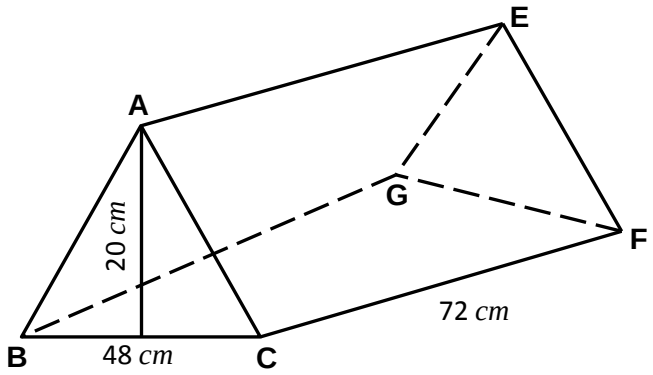
_____

_____

_____ (3)

QUESTION 6 **[8]**

In the triangular prism below, $AB = AC = 25cm$ and $AD \perp BC$



Calculate:

6.1 Volume of the prism

_____

_____

_____ (2)

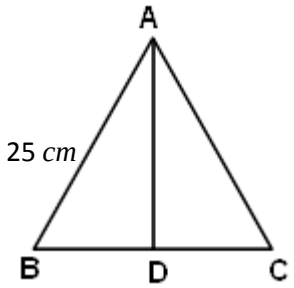
6.2 Surface Area of the prism

_____

_____

_____ (3)

6.3 In the triangle below, BC = 48 cm and BD = DC. Show that AD = 7 cm.



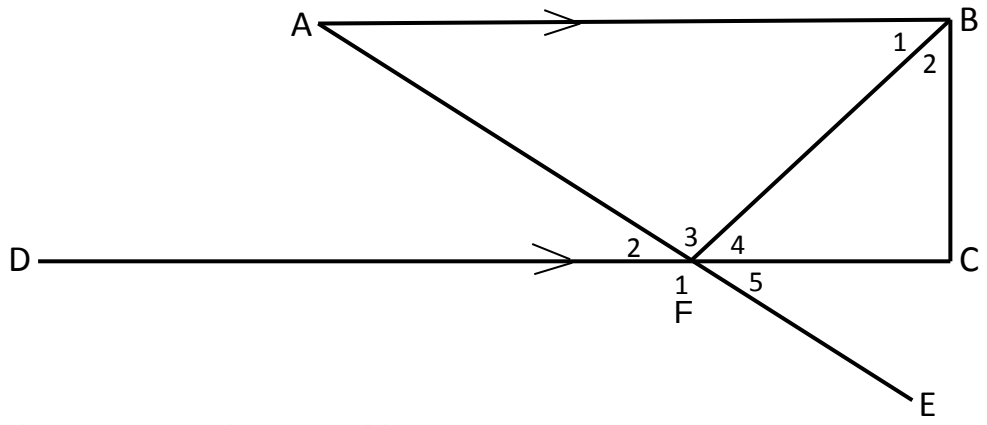
_____

_____

_____ (3)

QUESTION 7 **[24]**

7.1 Given: AB // CD



Complete the statement and give suitable reasons.

Statement	Reasons
7.1.1 $\hat{F}_2 = \hat{F}_5$	_____
7.1.2 $\hat{B}_1$ = _____	Alternate angles
7.1.3 $\hat{C}$ + A$\hat{B}$C= _____ °	
7.1.4 If $\hat{B}_2 = \hat{F}_4$ then BC = _____	_____

(5)

7.2 Using a pencil, ruler and a pair of compasses construct ΔEFG with FG = 6,5 cm, EG = 6 cm and EF = 3 cm.

_____

_____

_____

_____

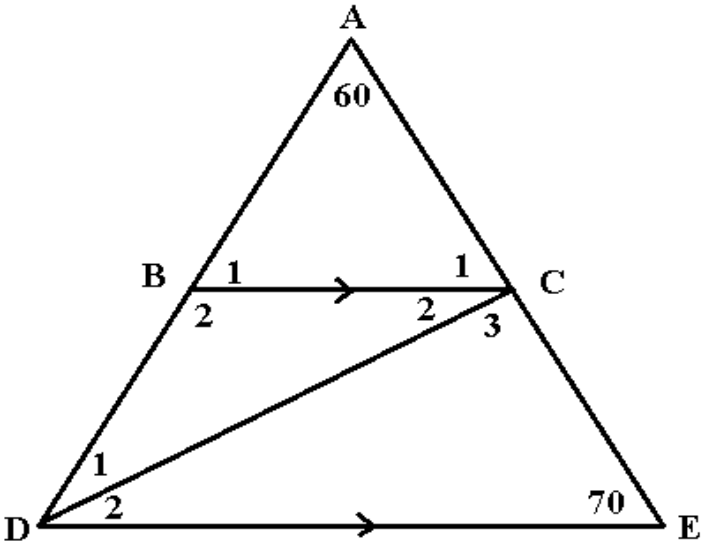
_____

_____

(4)

7.3 Study the following diagram and then answer the questions that follow.

BC//DE and $\widehat{D}_1 = \widehat{D}_2$. Determine the size of the following angles with reasons.



7.3.1 $\widehat{D}_2$

Statement	Reason

(2)

7.3.2 $\hat{C}_1$, $\hat{C}_2$ and $\hat{C}_3$.

Statement	Reason

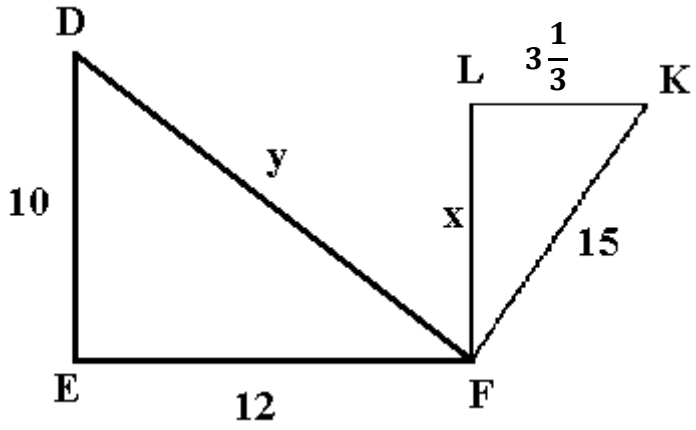
(6)

7.3.3 $\hat{B}_1$ and $\hat{B}_2$.

Statement	Reason

(4)

7.4 In the diagram below ΔDEF /// ΔKLF. Determine the values of x and y. Round off your answer to the nearest whole numbers.



Statement	Reason

(3)

QUESTION 8 **[11]**

Given below are the heights in cm of 12 learners at a school.

142	163	169	132
161	132	162	172
141	170	156	155

8.1 Arrange the heights in ascending order.

_____

_____ (1)

8.2 Determine the following:

8.2.1 The average height of the 12 learners

_____

_____ (2)

8.2.2 The median

_____

_____ (2)

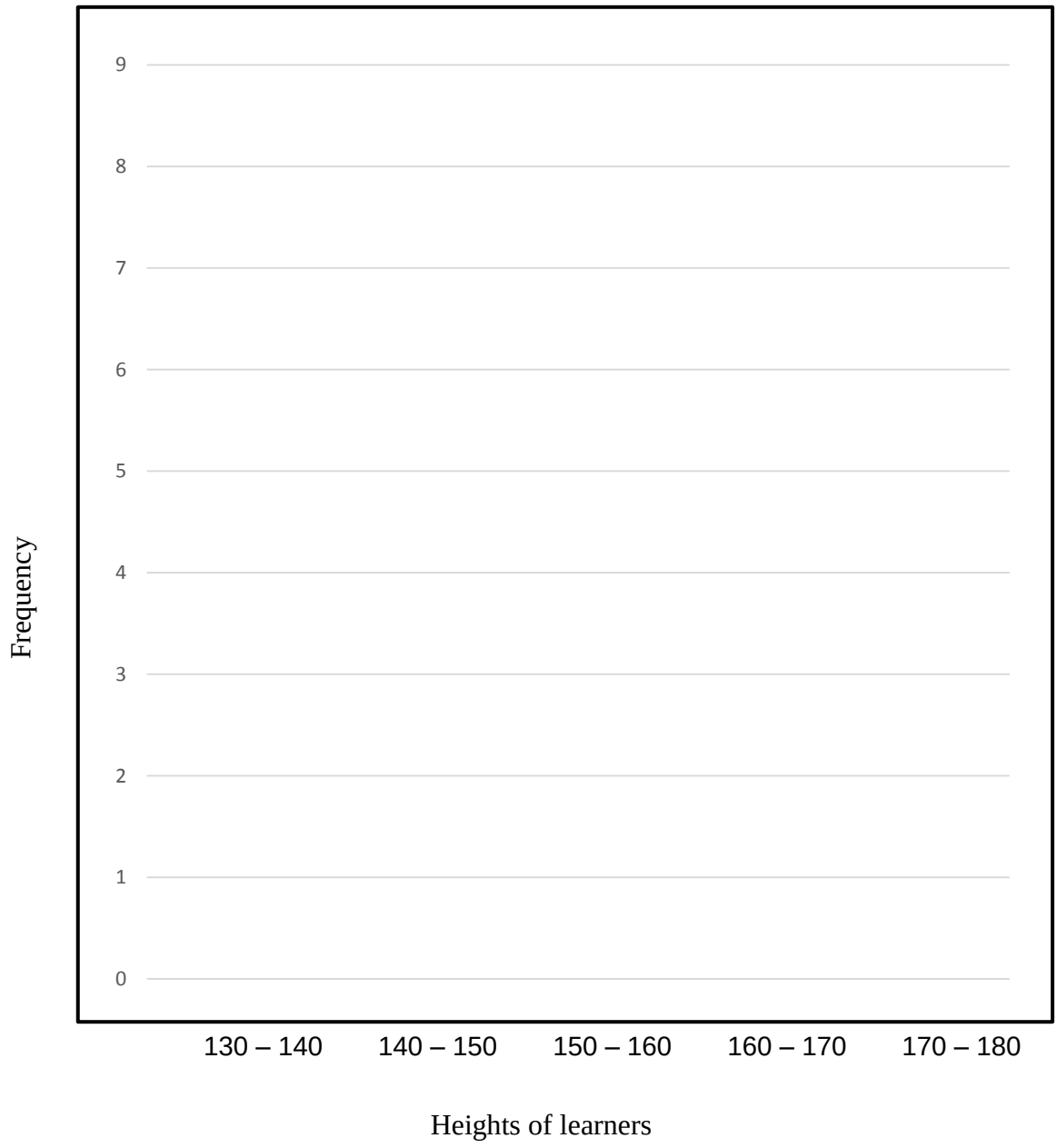
8.2.3 The mode

_____

_____ (1)

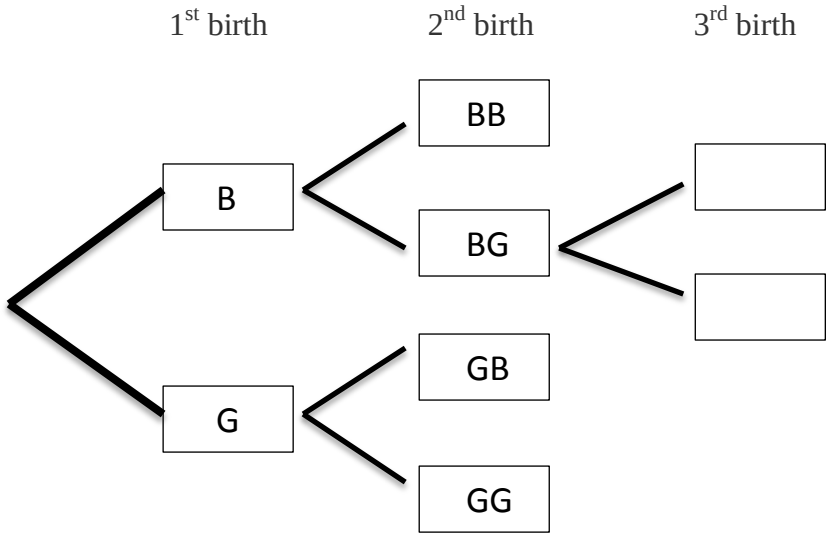
8.3 Use the following table to draw a bar graph. (3)

Height in cm	Frequency
$130 \leq h < 140$	7
$140 \leq h < 150$	5
$150 \leq h < 160$	7
$160 \leq h < 170$	9
$170 \leq h < 180$	2



8.4 The tree diagram below shows the possible outcome of a child's birth up to the third birth.

B represents a boy child and G represents a girl child. Complete the missing outcome in the third birth. (2)



TOTAL: 100

END

FORMULA SHEET

Simple Interest:	Compound Interest:
$I = \frac{Prn}{100}$ $A = P(1 + in)$ $A = P(1 + \frac{rn}{100})$	$A = P(1 + i)^n$ $A = P(1 + \frac{r}{100})^n$

	Perimeter	**Area**
Rectangle	$2(l + b)$	$l \times b$
Circle	$2\pi r$	πr^2
Triangle	$(s1 + s2 + s3)$	$\frac{1}{2} b \times\perp h$