GAUTENG PROVINCE
EDUCATION
REPUBLIC OF SOUTH AFRICA

GAUTENG DEPARTMENT OF EDUCATION

PROVINCIAL EXAMINATION

NOVEMBER 2019

GRADE 9

MATHEMATICS

NAME OF LEARNER: _____

GRADE / CLASS: _____

TIME: 2 hours

MARKS: 100

19 pages

INSTRUCTIONS AND INFORMATION

Read the following instructions carefully before answering the questions.

1. This question paper consists of 9 questions and 19 pages, including the attached FORMULA SHEET.

2. Answer ALL the questions on the question paper.

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 for statements made when answering geometry questions.

7. Answer questions 2 to 9 in Section B in the spaces provided.

8. Write neatly and legibly.

SECTION A

QUESTION 1

Circle the letter of **the correct answer**.

1.1 Complete: 0,000163 written in scientific notation = …

A $1{,}63 \times 10^{-3}$

B $1{,}63 \times 10^{-4}$

C 163×10^{-3}

D $1{,}63 \times 10^{4}$ (1)

1.2 What will a 20 kg bag weigh if its mass is increased by 40% ?

A 60 kg

B 32 kg

C 28 kg

D 24 kg (1)

1.3 Complete: $-9 - (2x - 3) = ...$

A $-18x + 3$

B $-2x - 6$

C $-2x - 12$

D $18x - 3$ (1)

1.4 R600 is invested at 6% per annum compound interest for 6 years.

Complete: A = …

A $\text{R}600(1{,}06)^{6}$

B $\text{R}600(0{,}06)^{6}$

C $\text{R}600(1 + 0{,}36)$

D $\text{R}600(0{,}36)$ (1)

1.5 Study the diagram pattern below. Each diagram was created using matchsticks. The table below gives the number of matchsticks in each figure.

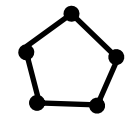


Figure 1

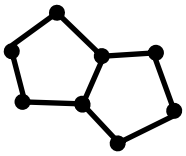


Figure 2

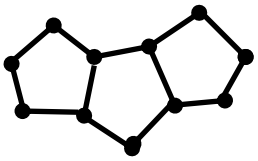


Figure 3

Figure number	1	2	3
No. of matchsticks	5	9	13

How many matchsticks will there be in Figure 6 if the pattern continues?

A $T_n = n + 4$

B $T_n = 4n + 1$

C $T_n = 4n - 1$

D $Tn = -4n + 1$ (1)

1.6 What is the probability of drawing a card marked 5 from a pack of 52 playing cards?

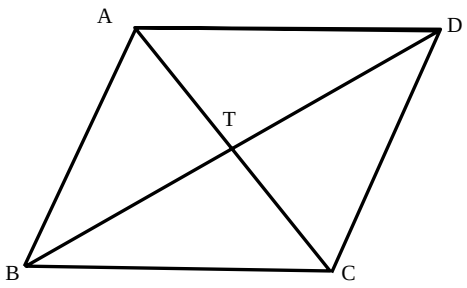
A $\frac{1}{5}$

B $\frac{1}{4}$

C $\frac{1}{52}$

D $\frac{1}{13}$ (1)

1.7 In the figure below AT = TC, BT = DT and AC ⊥ BD.



What kind of quadrilateral is ABCD?

A A kite

B A rhombus

C A parallelogram

D A rectangle (1)

1.8 In ΔPQT, $\hat{P} : \hat{Q} : \hat{T} = 1 : 3 : 5$

Calculate the size of $\hat{T}$.

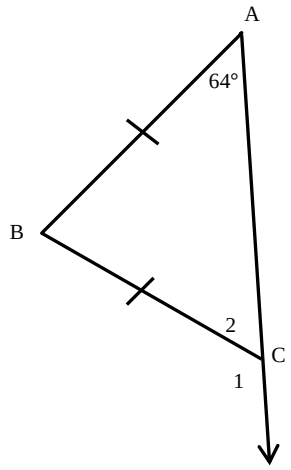
A 20°

B 60°

C 100°

D 120° (1)

1.9 In the figure below AB = AC and $\hat{A} = 64°$.



Calculate the size of $\hat{C}_1$.

A $58°$

B $64°$

C $116°$

D $122°$ (1)

1.10 The length of a rectangle $= x$ cm and the width $= y$ cm.

Both the length and the width of the rectangle are **doubled**.

What is the perimeter of the bigger rectangle?

A $2x+2y$ cm

B $2(x + y)$ cm

C $4(x + y)$ cm

D $x^2 + y^2$ cm (1)

[10]

SECTION B

QUESTION 2

2.1 Write 0,36 : 0,84 in the simplest form.

_____

_____ (2)

2.2 Calculate: $-4x^2$ if $x = -\frac{1}{2}$

_____

_____ (2)

2.3 Simplify:

2.3.1 $\left(\sqrt{16}\right)^2 - \sqrt[3]{4^6}$

_____

_____

_____ (2)

2.3.2 $(2x + 5)(x - 3) + (x - 1)^2$

_____

_____

_____ (4)

[10]

QUESTION 3

Factorise fully:

3.1 $60x^2y - 25xy^2 + 5xy$

_____

_____ (2)

3.2 $k^2 - 64$

_____ (2)

3.3 $x^2 + 7x - 18$

_____ (2)

3.4 $ax - ay + 4x - 4y$

_____

_____

_____ (3)

[9]

QUESTION 4

Solve for x.

4.1 $3x + 5 = 11$

_____

_____

_____ (2)

4.2 $x^3 = \frac{1}{8}$

_____

_____

_____ (2)

4.3 $x^2 - 7x + 10 = 0$

_____

_____ (2)

[6]

QUESTION 5

5.1 A turkey costs 5 times more than a chicken. A farmer bought 20 turkeys and 50 chickens for R1 200.

Calculate the price of one turkey.

_____

_____

_____

_____ (5)

5.2 Calculate how much I must invest at 7% p.a. simple interest to have R15 000,00 in my account at the end of 6 years.

_____

_____

_____

_____

(3)

5.3 A taxi covers a distance in 3 hours at an average speed of 80 km/h.
How long will it take to cover the same distance if the average speed is 60 km/h?

_____

_____

_____

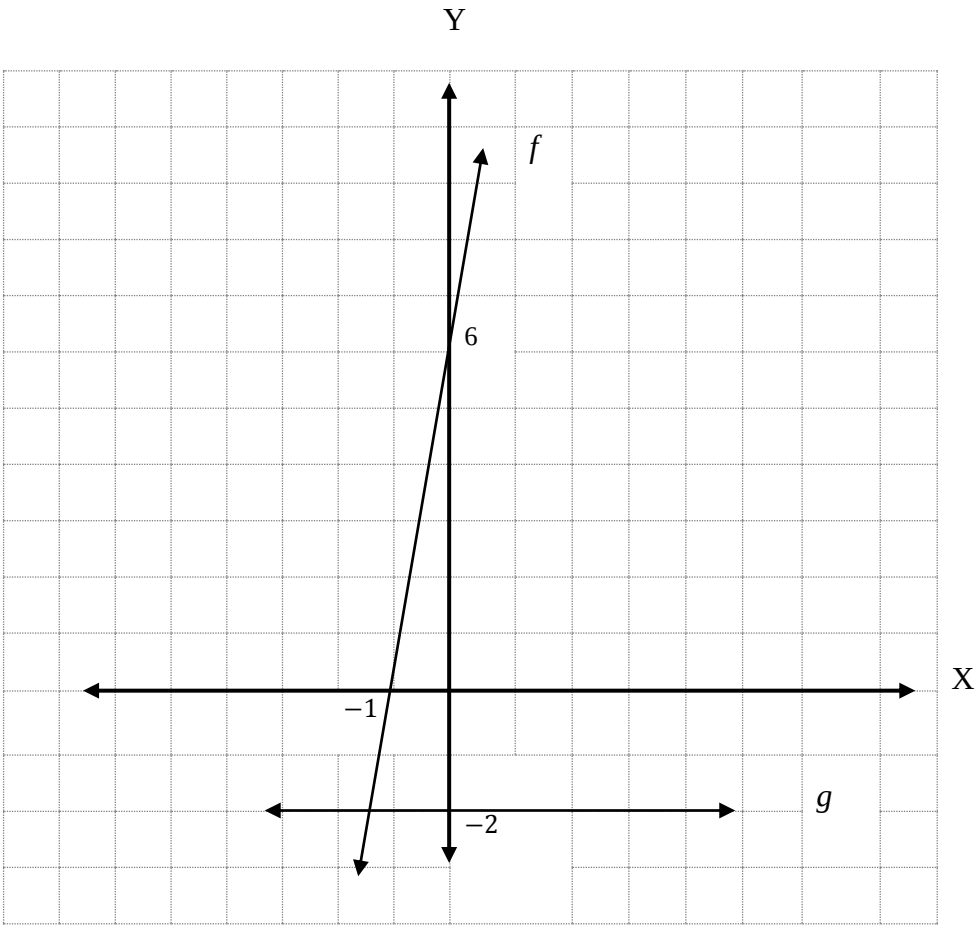
_____

(6)

[14]

QUESTION 6

6.1 Determine the equation of the given straight line graph of f. (4)



_____

_____

_____

_____

_____

6.2 Write down the equation of the graph of g.

_____ (1)

[5]

QUESTION 7

7.1 The following are the marks obtained by a group of learners in a test out of 60.

12	21	23	35	42	54	57	31	43	35	46	37	55

7.1.1 Draw a stem-and-leaf plot to organize the data.

Stem	Leaves

(5)

7.1.2 What is the range of the marks?

_____

(1)

7.1.3 How many learners obtained more than 50% for the test?

_____

(1)

7.2 A bag contains 3 green, 5 red and 7 blue buttons. A button is randomly taken out of the bag.

Determine the probability of taking out:

7.2.1 A red button

_____

(1)

7.2.2 A green or blue button

_____

(2)

7.2.3 A yellow button

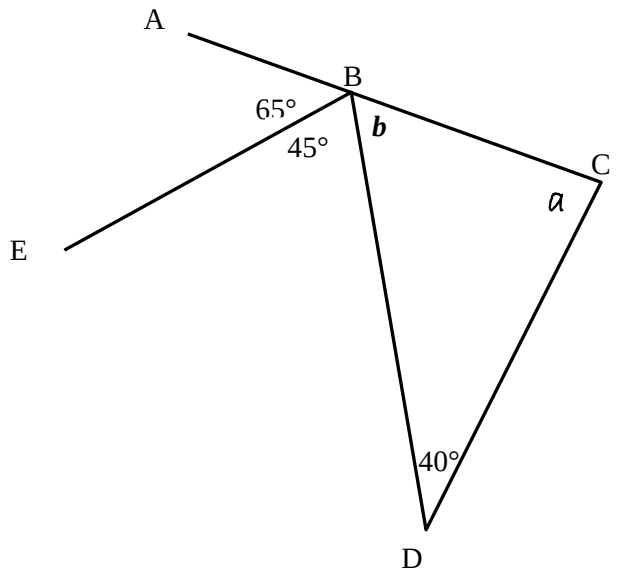
_____

(1)

[11]

QUESTION 8

8.1 In the diagram below, ABC is a straight line. $A\widehat{B}E = 65°$, $D\widehat{B}E = 45°$ and $B\widehat{D}C = 40°$.



8.1.1 Calculate the value of b.

Statement	**Reason**
$65° + 45° + b =$	
$b =$	

(3)

8.1.2 Calculate the value of a.

Statement	**Reason**
$b + a + 40° =$	
$a =$	

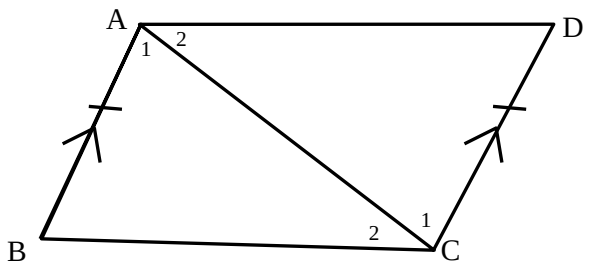
(3)

8.1.3 What can you conclude about ΔBCD?
Give a reason for your answer.

Statement	**Reason**

(2)

8.2 In quadrilateral ABCD, AB = DC and AB∥ DC.

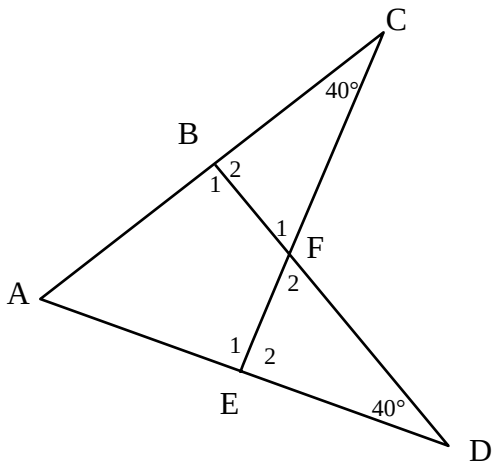


Prove that ΔABC ≡ ΔCDA.

Statement	**Reason**
In ΔABC and ΔCDA:	

(5)

8.3 In the figure below, $\hat{C} = \hat{D} = 40°$ and $\hat{E}_1 = 80°$.



Prove that Δ CFB ||| ΔDFE

Statement	**Reason**
In ΔCFB and ΔDFE	

(4)

8.4 8.4.1 Use a pair of compasses, ruler and a sharp pencil to construct triangle ABC in the frame below, so that $AB = BC = 7$ cm and $\hat{A} = 65°$.

(2)

8.4.2 By measurement: The size of $A\hat{B}C = \ldots$

_____ (1)

8.5 Point $H(-3; 4)$ is translated 3 units to the right and 2 units down.

Write down the co-ordinates of its image H'.

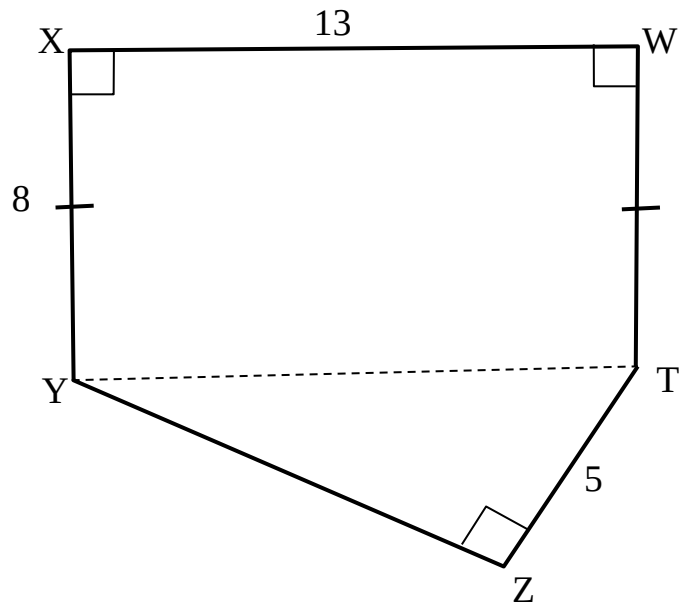
_____

_____ (2)

[22]

QUESTION 9

9.1 In the figure below XW = 13 units, XY = 8 units and TZ = 5 units.
$\hat{X} = 90°$, $\hat{W} = 90°$ and $\hat{Z} = 90°$.

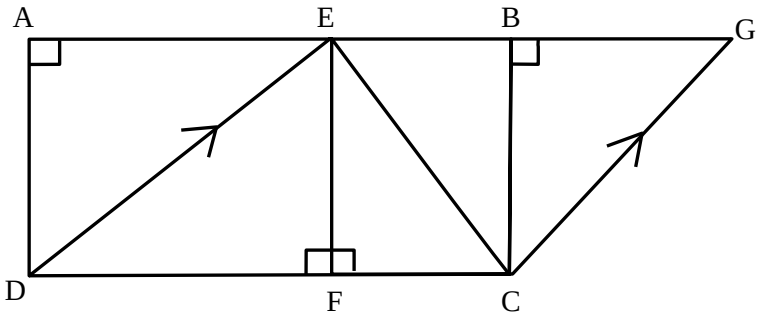


Calculate the length of YZ, correct to two decimal places.

Statement	**Reason**

(4)

9.2



Refer to the above diagram and complete the following:

Example: The area of $\Delta CBG = \frac{BG \times BC}{2}$

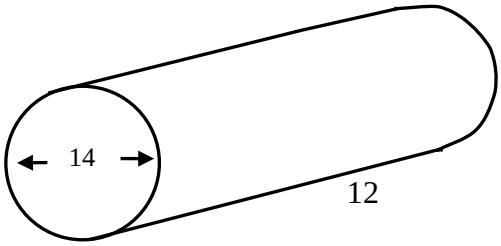
9.2.1 The area of ABCD = _____

9.2.2 The area of ΔDEC = _____

9.2.3 The area of parallelogram CDEG = _____

9.2.4 The area of trapezium AECD = _____ (4)

9.3 Calculate the total surface area of a cylindrical metal rod with a Diameter = 14 cm, Height = 12 cm and $\pi = \frac{22}{7}$.



_____

_____

_____

_____

_____ (5)

[13]

TOTAL: 100

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
Trapezium	$S_1 + S_2 + S_3 + S_4$	$\frac{1}{2}(sum\ of\ parallel\ sides) \times h$
Triangle	$S_1 + S_2 + S_3$	$\frac{1}{2}b \times \perp h$A