GAUTENG PROVINCE
EDUCATION
REPUBLIC OF SOUTH AFRICA

GAUTENG DEPARTMENT OF EDUCATION

PROVINCIAL EXAMINATION

NOVEMBER 2018

GRADE 9

MATHEMATICS

NAME OF LEARNER: _____

GRADE / CLASS: _____

TIME: 2 hours

MARKS: 100

18 pages + 1 formula sheet

P.T.O.

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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.

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 TWO decimal places, unless otherwise stated.

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

7. Answer Questions 2 to 9 of Section B in the spaces provided on the question paper.

8. Write neatly and legibly.

SECTION A

QUESTION 1

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

1.1 Which one of the following numbers is irrational?

A $0,\dot{8}$

B $0,5$

C $-\sqrt{3}$

D $\sqrt{2\frac{1}{4}}$

(1)

1.2 $\sqrt{\sqrt{81}} = \ldots$

A 3

B 9

C 27

D 81

(1)

1.3 The ratio $4\frac{1}{3} : 3\frac{1}{4}$ written in its simplest form is ...

A $52 : 39$

B $\frac{13}{3} : \frac{13}{4}$

C $4 : 3$

D $\frac{52}{12} : \frac{39}{12}$

(1)

1.4 $(x-2)^2 = \ldots$

A $x^2 - 4$

B $x^2 + 4x - 4$

C $x^2 - 4x + 4$

D $x^2 - 4x - 4$ (1)

1.5 $x = -3$, $\frac{x+3}{x-3} = \ldots$

A 0

B -6

C -1

D undefined (1)

1.6 The general rule T_n for the pattern $3; 7; 11; 15 \ldots$ is …

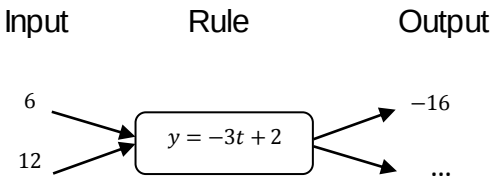
A $T_n = -4n + 1$

B $T_n = 4n + 1$

C $T_n = 4n - 1$

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

1.7 Complete the flow diagram by using the given rule.



A -18

B -34

C -36

D -38 (1)

1.8 Complete:

If two straight lines are parallel, then the ...

A product of the gradients is -1.

B gradients are equal.

C product of the gradients is 1.

D sum of the gradients is 0. (1)

1.9 12 m³ = …

A 12 000 000 kℓ

B 12 000 kℓ

C 12 kℓ

D 0,012 kℓ (1)

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

Complete:

If both the length and the width of the rectangle are **doubled,** then the area of the rectangle will be ...

A $2\,xy$ cm^2

B $2(x + y)$cm^2

C $4xy$ cm^2

D $4(x + y)$ cm^2 (1)

[10]

SECTION B

QUESTION 2

2.1 Write $1{,}32 \times 10^{-6}$ in decimal form.

_____

_____ (1)

2.2 Decrease R240 by 20%.

_____

_____ (2)

2.3 Simplify:

2.3.1 $\dfrac{(5x^2)^2y^3 \times (2xy)^2}{50x^4y^5}$

_____

_____ (4)

2.3.2 $\dfrac{\sqrt[3]{x^9}}{(4x^2)^0}$

_____

_____

_____ (2)

2.3.3 $\dfrac{x+3}{5} - \dfrac{3x+2}{3}$

_____

_____

_____

_____

_____ (3)

[12]

QUESTION 3

Factorise fully:

3.1 $36xy - 9y$

(2)

3.2 $x^2 - 81$

(2)

3.3 $x^2 - 2x - 3$

(2)

[6]

QUESTION 4

Solve for x.

4.1 $\frac{2x-3}{2} = \frac{x+1}{6}$

(4)

4.2 $2^{x-1} = 4$

(3)

4.3 $x^2 - 7x + 12 = 0$

_____

_____ (2)

[9]

QUESTION 5

5.1 Joe travelled 3 hours by car at a speed of 110 km/h.

Calculate the distance that Joe travelled.

_____

_____

_____

_____ (3)

5.2 8 boys each contribute R115, 50 towards the purchase of a tent. Calculate how much each boy will have to contribute to buy the same tent, if there were 10 boys in the group.

_____

_____

_____

_____ (3)

5.3 How long will it take for an investment of R5 000, at 6% per annum simple interest, to earn R1 200 interest?

_____

_____

_____

_____ (3)

5.4 Calculate what R15 000 will amount to if it is invested at 5,5 % per annum compound interest for 5 years.

_____

_____

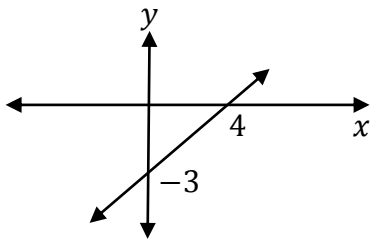
_____

_____ (3)

[12]

QUESTION 6

6.1 Determine the equation of the given straight-line graph. Use $y = mx + c$.



_____

_____

_____

_____ (4)

6.2 Determine the gradient of the straight line perpendicular to the given graph.

_____

_____

_____

_____ (3)

[7]

QUESTION 7

7.1 The stem-and-leaf diagram below represents the marks of the learners in a Grade 9 class for a Mathematics test.

Stem	Leaves							
1	0	0	1	1	8			
2	2	3	5	5	6	8	9	
3	0	1	2	3	3	3	4	5

7.1.1 How many learners wrote the test?

_____ (1)

7.1.2 Calculate the average mark obtained by the class.

_____

_____ (2)

7.1.3 Determine the modal mark for the test.

_____ (1)

7.1.4 Determine the median mark.

_____

_____ (2)

7.2 Cards numbered 1 to 6 are put into a bag. Athletes draw a card to decide the lane in which they will run in a track event.

7.2.1 What is the probability that a particular athlete will draw the card for lane one?

_____

_____ (1)

7.2.2 What is the probability of the next athlete choosing any one of the remaining numbers?

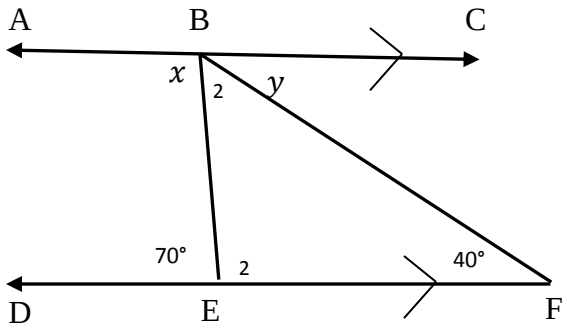
_____

_____ (1)

[8]

QUESTION 8

8.1 In the diagram below, ABC ∥ DEF, $D\hat{E}B = 70°$, $\hat{F} = 40°$, $A\hat{B}E = x°$ and $C\hat{B}F = y°$.

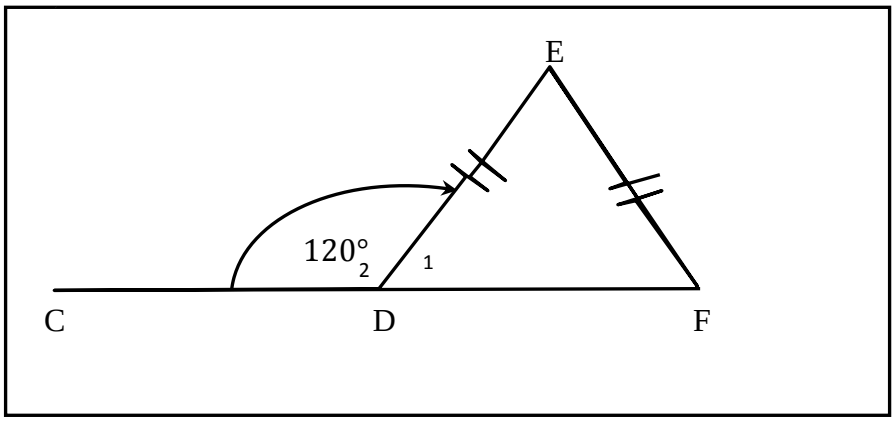


Determine the values of x and y.

Statement	Reason
_____ + _____ = _____	_____
$x =$ _____	
$y =$ _____	_____

(5)

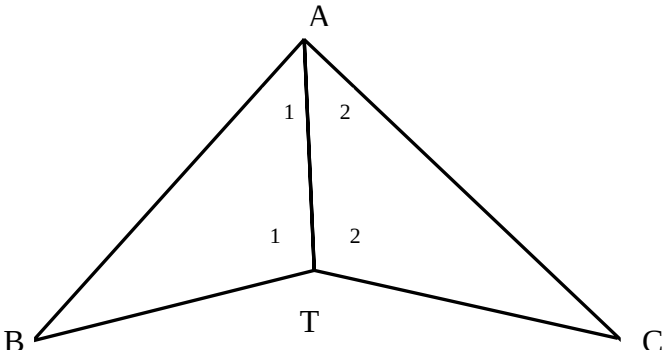
8.2 In ΔEDF , FD is produced to C. $ED = EF$ and $C\hat{D}E = 120°$.
Calculate the size of $\hat{E}$.



Statement	Reason
$\hat{D}_1 + \hat{D}_2 =$ _____	
$\hat{D}_1 =$ _____	
$\hat{D}_1 = \hat{F}$	
$\hat{E} + \hat{F} + \hat{D}_1 =$ _____	
$\therefore \hat{E} =$ _____	

(6)

8.3

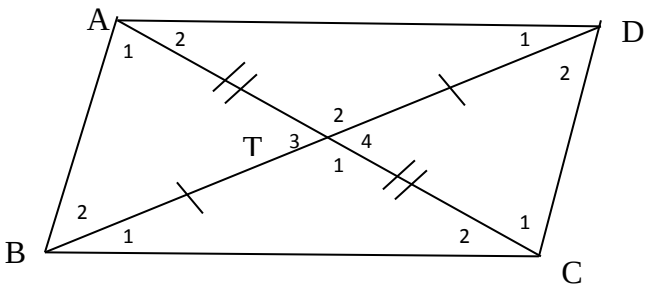


In the diagram above, $\hat{A}_1 = \hat{A}_2$ and $\hat{B} = \hat{C}$.
Complete:

Statement	Reason
$\Delta ABT \equiv \Delta ACT$	

(1)

8.4 The diagonals of ABCD **bisect** each other at T.

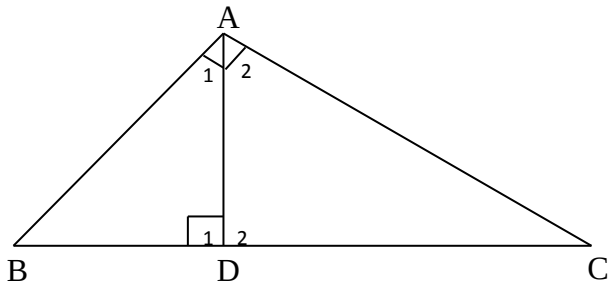


Prove that $\Delta ATB \equiv \Delta CTD$.

Statement	Reason
In ΔATB and ΔCTD	
$\therefore \Delta ATB \equiv \Delta CTD$	_____

(4)

8.5 In ΔABC, BA ⊥ AC, AD ⊥ BC and $\hat{A}_1 = \hat{C}$



8.5.1 Prove that ΔABD ||| ΔCBA.

Statement	Reason
In ΔABD and ΔCBA	

(4)

8.5.2 Calculate the length of AB if CB = 49 cm and BD = 9 cm.

Statement	Reason
In ΔABD and ΔCBA	
$\frac{AB}{CB} = — = —$	proportional sides of similar Δs
$\therefore AB =$ _____	

(3)

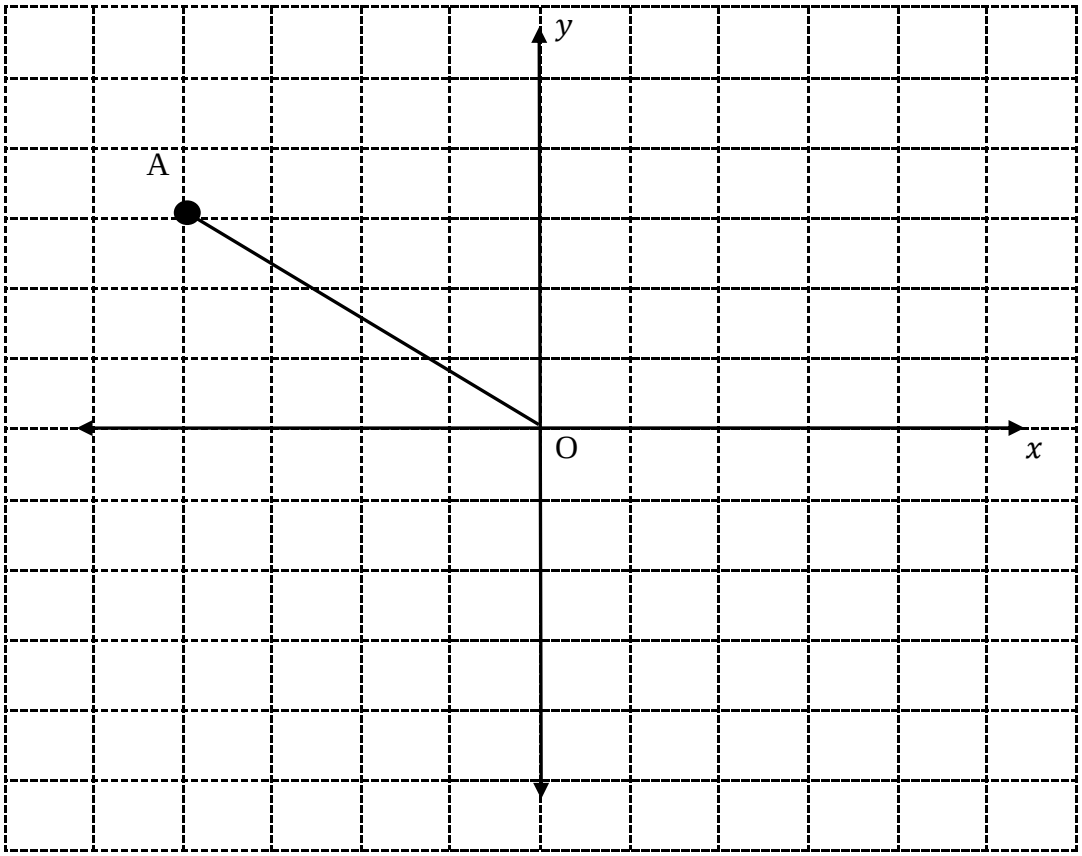
8.6

8.6.1 Use your pair of compasses, ruler and a sharp pencil to construct triangle ABC in the frame below, so that $AB = BC = CD = 6{,}5$ cm.

(2)

8.6.2 By measurement: The size of $A\hat{B}C =$ _____ (1)

8.7 The co-ordinates of A are $(-4\,;3)$.



8.7.1 Write down the co-ordinates of A' if A' is the reflection of A in the $x-$axis.

_____

(1)

8.7.2 Write down the co-ordinates of A'' if A'' is the reflection of A in the $y-$axis.

_____

(1)

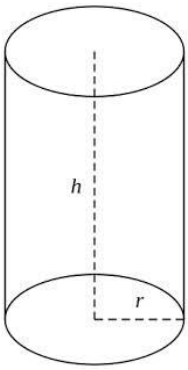
8.7.3 Write down the co-ordinates of A''' if A is rotated anti-clockwise about the origin through 180°.

_____

(1)

[29]

QUESTION 9



The cylinder above has a base with a diameter $= 14$ cm, height $= 16$ cm and $\pi = 3{,}14$.

9.1 Calculate the curved surface area of the cylinder.

_____

_____

_____

_____ (4)

9.2 Calculate the volume of the cylinder.

_____

_____

_____

_____ (3)

[7]

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	$(s1 + s2 + s3)$	$\frac{1}{2} b \times \perp h$