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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

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TIME: 2 hours

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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 0,8

B 0,5

C $-\sqrt{3}$

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

(1)

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

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 $(x-2)^2 = \dots$

A $x^2 - 4$

B $x^2 + 4x - 4$

C $x^2 - 4x + 4$

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

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

A 0

B -6

C -1

D undefined (1)

1.6 The general rule T_n for the pattern 3; 7; 11; 15 ... is ...

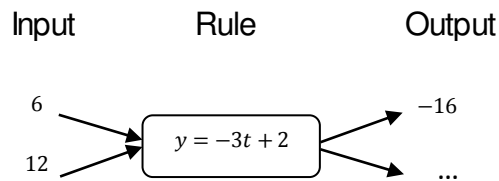
A $T_n = -4n + 1$

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 $12 \text{ m}^3 = \dots$

- A $12\,000\,000 \text{ k}\ell$
- B $12\,000 \text{ k}\ell$
- C $12 \text{ k}\ell$
- D $0,012 \text{ k}\ell$ (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 $2xy \text{ cm}^2$

B $2(x + y)\text{cm}^2$

C $4xy \text{ cm}^2$

D $4(x + y) \text{ cm}^2$

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

(4)

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

(2)

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

(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)

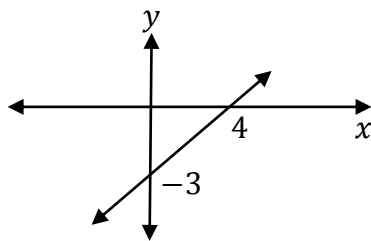
- 5.4 Calculate what R15 000 will amount to if it is invested at 5,5 % per annum compound interest for 5 years.

(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)

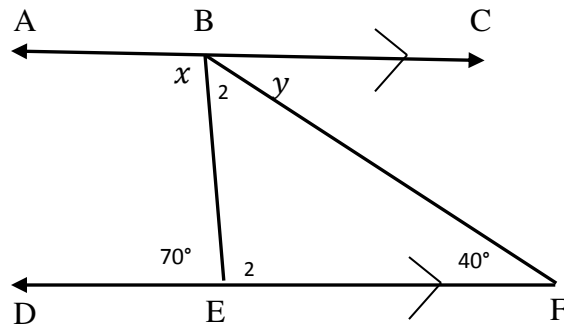
- 7.2.2 What is the probability of the next athlete choosing any one of the remaining numbers?

(1)

[8]

QUESTION 8

8.1 In the diagram below, $ABC \parallel DEF$, $\widehat{DEB} = 70^\circ$, $\widehat{F} = 40^\circ$, $\widehat{ABE} = x^\circ$ and $\widehat{CBF} = y^\circ$.

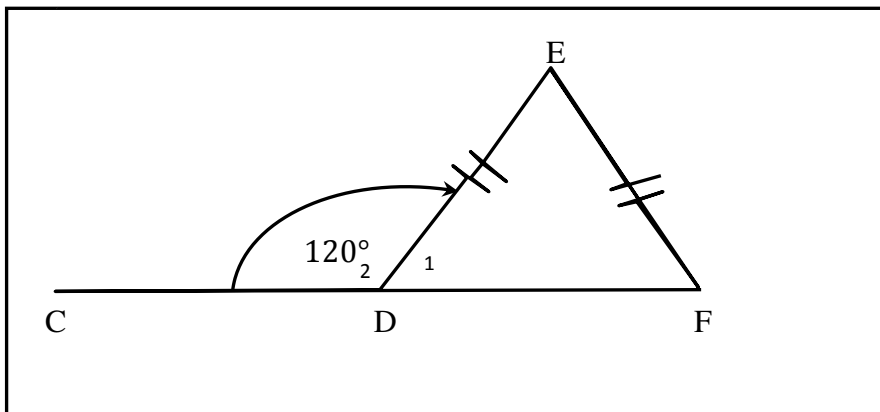


Determine the values of x and y .

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

(5)

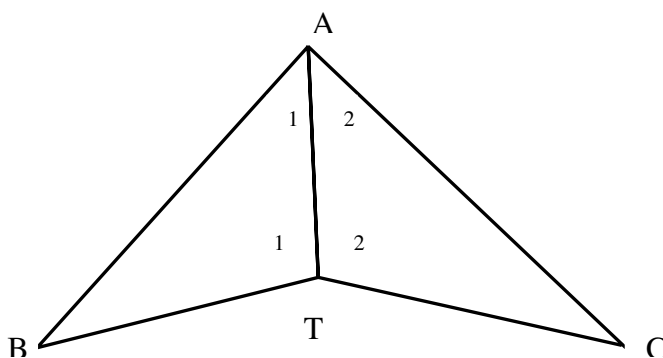
- 8.2 In $\triangle EDF$, FD is produced to C . $ED = EF$ and $\angle CDE = 120^\circ$.
Calculate the size of $\angle E$.



Statement	Reason
$\hat{D}_1 + \hat{D}_2 = \underline{\hspace{2cm}}$	
$\hat{D}_1 = \underline{\hspace{2cm}}$	
$\hat{D}_1 = \hat{F}$	
$\hat{E} + \hat{F} + \hat{D}_1 = \underline{\hspace{2cm}}$	
$\therefore \hat{E} = \underline{\hspace{2cm}}$	

(6)

8.3

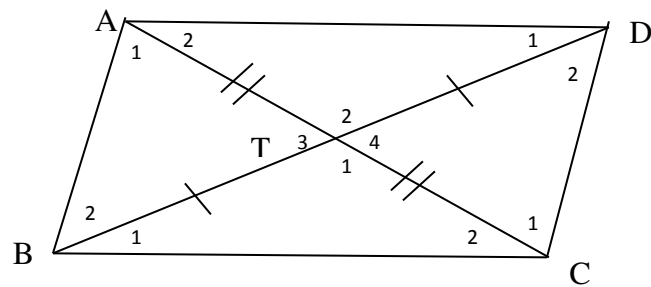


In the diagram above, $\hat{A}_1 = \hat{A}_2$ and $\hat{B} = \hat{C}$.
Complete:

Statement	Reason
$\triangle ABT \equiv \triangle ACT$	

(1)

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

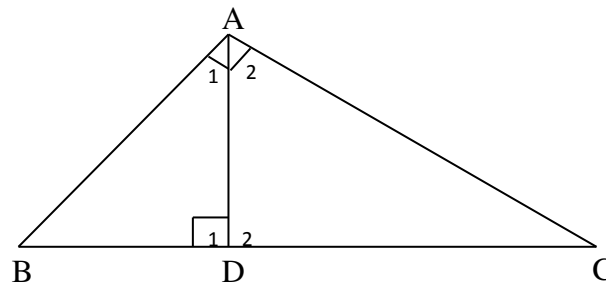


Prove that $\triangle ATB \equiv \triangle CTD$.

Statement	Reason
In $\triangle ATB$ and $\triangle CTD$	
$\therefore \triangle ATB \equiv \triangle CTD$	_____

(4)

8.5 In $\triangle ABC$, $BA \perp AC$, $AD \perp BC$ and $\hat{A}_1 = \hat{C}$



8.5.1 Prove that $\triangle ABD \sim \triangle CBA$

Statement	Reason
In $\triangle ABD$ and $\triangle CBA$	

(4)

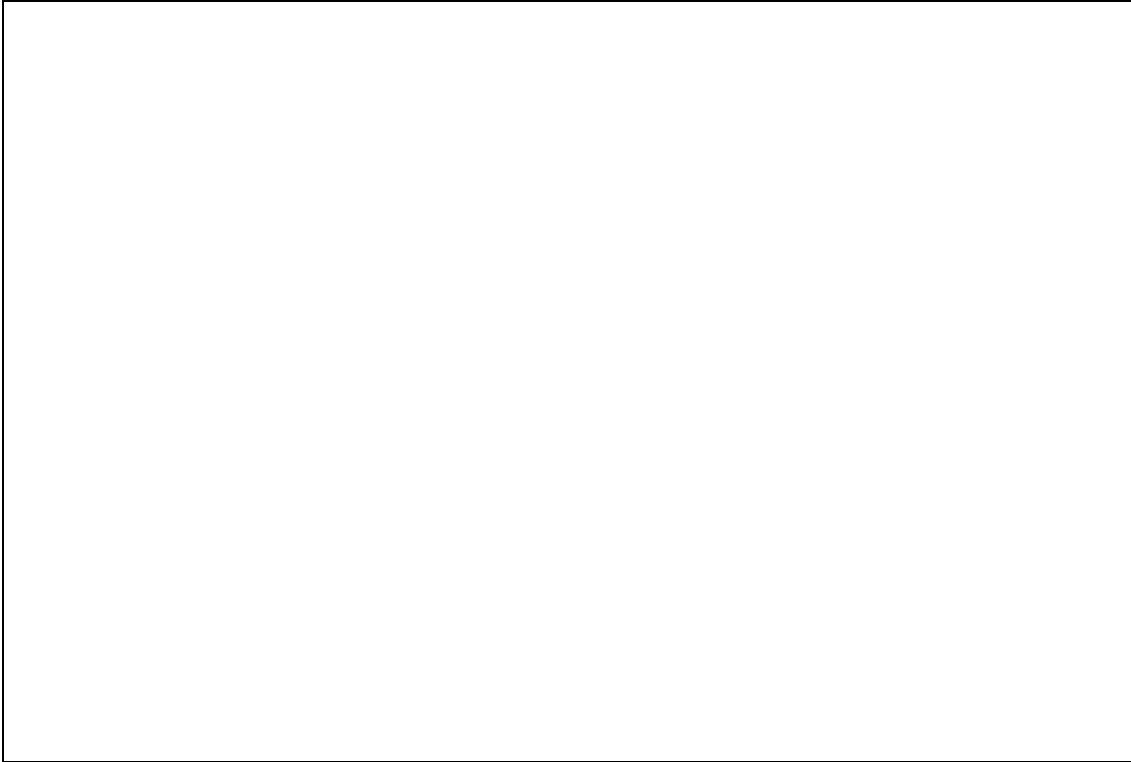
8.5.2 Calculate the length of AB if $CB = 49$ cm and $BD = 9$ cm.

Statement	Reason
In $\triangle ABD$ and $\triangle CBA$	
$\frac{AB}{CB} = \frac{BD}{BA} = \frac{AD}{CA}$	proportional sides of similar $\triangle$ s
$\therefore AB = \underline{\hspace{2cm}}$	

(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 $AB = BC = CD = 6,5 \text{ cm}$.

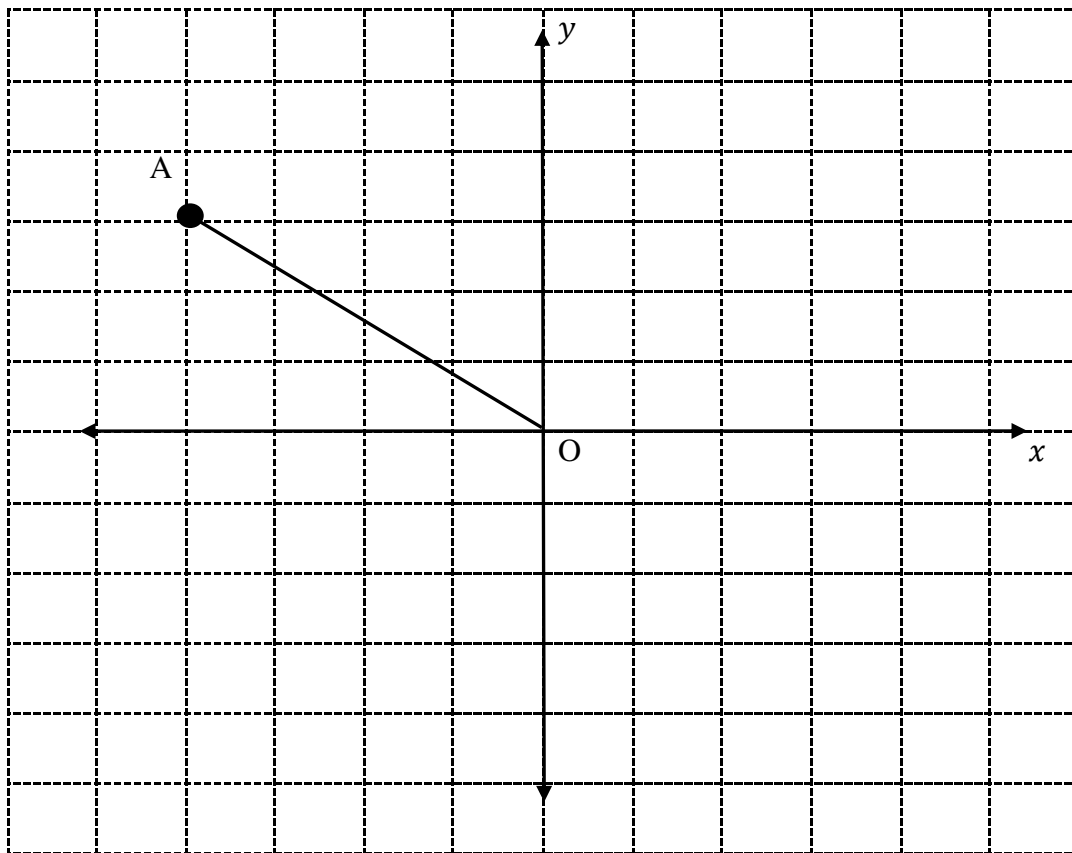


(2)

- 8.6.2 By measurement: The size of $\hat{A}BC =$ _____

(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.

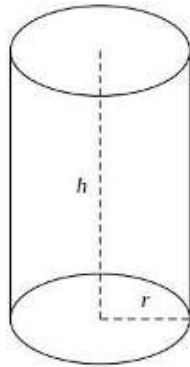
(1)

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

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