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GAUTENG DEPARTMENT OF EDUCATION
PROVINCIAL EXAMINATION
JUNE 2018
GRADE 9

MATHEMATICS

NAME OF LEARNER: _____

GRADE 9: _____

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 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 geometric calculations.
- 7 Number the answers correctly according to the numbering system used in this question paper.
- 8 Circle the letter of the correct answer in Section A on the paper.
Answer Questions 1 to 9 of Section B in the spaces provided.
- 9 Write neatly and legibly.

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SECTION A

QUESTION 1

Answer the following questions by choosing the correct answer. Circle the letter next to the correct answer.

- 1 Complete the statement:

The sum of money that is borrowed or invested, is called ...

- A the interest rate.
- B principal amount.
- C accumulated amount.
- D simple interest.

(1)

- 2 A train travelling at 40 km/h takes 3 hours for a journey. How long will it take the train to complete the same journey, travelling at 90 km/h?

- A 2 hours
- B 1 hour
- C 4 hours
- D 1 hour 20 min

(1)

- 3 Complete: $2x(x - 2) - (x - 5)x = \dots$

- A $3x^2 + x$
- B $x^2 + x$
- C $x^2 + 9x$
- D $x^2 - 9x$

(1)

- 4 The diagram pattern below consists of crosses.

XX

Diagram 1

XX
XX

Diagram 2

XXXX
XXXX

Diagram 3

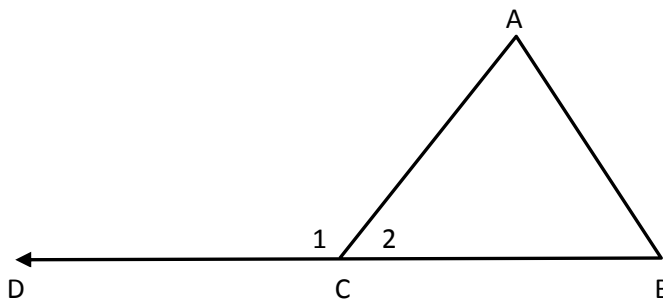
How many crosses will there be in Diagram 6 if the pattern continues?

- A 16
- B 32
- C 64
- D 128

(1)

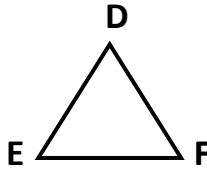
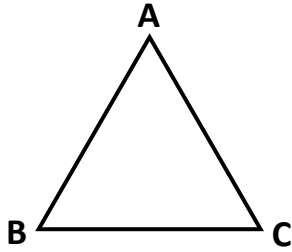
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- 5 Which one of the following numbers lies between 0,07 and 0,08 on the number line?
- A 0,00075
 B 0,0075
 C 0,075
 D 0,75 (1)
- 6 If 4,5 kg of sugar costs R36, what will 2,5 kg of sugar cost?
- A R20
 B R36
 C R90
 D R14,40 (1)
- 7 Complete the statement: The diagonals of a kite ...
- A are perpendicular to each other and bisect each other.
 B bisect the opposite angles and are equal to each other.
 C bisect the opposite angles and are perpendicular to each other.
 D are perpendicular to each other and not equal to each other. (1)
- 8 Complete: If $\triangle ABC$ is an equilateral triangle, the size of $\hat{C}_1$ is ...



- A 180°
 B 120°
 C 100°
 D 60° (1)

- 9 In $\triangle ABC$ and $\triangle DEF$, $\hat{A} = \hat{D}$ and $\hat{B} = \hat{E}$ and $AB:DE = 2:1$
Which of the following statements are correct?



- A $\triangle ABC \parallel \triangle DEF$ and $DF:AC = 1:2$
 B $\triangle ABC \equiv \triangle DEF$ ($\angle\angle\angle$)
 C $\triangle ABC \equiv \triangle DEF$ and $AC = \frac{1}{2}DF$
 D $\triangle ABC \parallel \triangle DEF$ and $BC = EF$ (1)

- 10 The length of a rectangle is $(x + 2)$ cm and the breadth is 4 cm **less** than the length. Which one of the following expressions represents the **perimeter** of the rectangle?

- A $(x + 2)(x + 2)$ cm
 B $4x$ cm
 C $(x + 2)(x - 2)$ cm
 D $4x(x + 2)$ cm (1)
[10]

SECTION B

QUESTION 1

1.1 Write 0,00000356 in scientific notation.

_____ (1)

1.2 Study the following expression:

$$3a^2b + 4a^3b - 6ab^2 + 9$$

1.2.1 How many terms are there in the expression?

_____ (1)

1.2.2 Write down the coefficient of b^2 .

_____ (1)

1.2.3 Write down the constant term.

_____ (1)

1.3 Simplify:

1.3.1 $xy^2 - 3x^2y - 10xy^2 + 17x^2y - 10x^2$

_____ (2)

1.3.2 $(4x - y)^2 + 8xy$

_____ (2)

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$$1.3.3 \quad \frac{2^2 \cdot 2^3 \cdot 8}{4^5}$$

(3)

[11]

QUESTION 2

Factorise fully:

$$2.1 \quad 4a^3 - 12a^2 - 36a$$

(2)

$$2.2 \quad 9(x + y) - y^2(x + y)$$

(3)

[5]

QUESTION 3

Solve the following equations:

$$3.1 \quad 6y = 5y - 4$$

(2)

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3.2 $(2^x)^2 = 128$

(4)

3.3 $\frac{2x-3}{2} - \frac{3x+1}{4} = 1$

(4)

[10]

QUESTION 4

4.1 R3350 is invested at 14,5% compound interest per annum for a period of 3 years.

Calculate:

4.1.1 The amount accumulated

(3)

4.1.2 The interest

(2)

P.T.O.



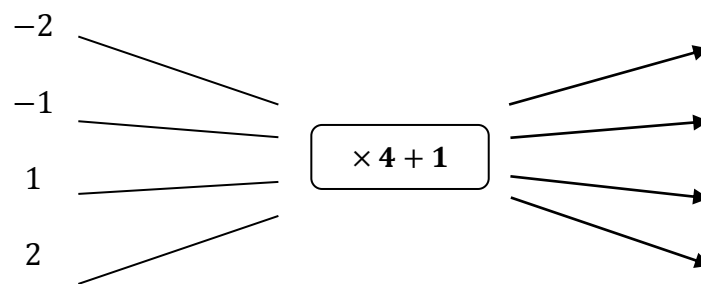
- 4.2 Dorcas walks a distance of 18 km from home to school at a speed of 6 km/h. How long does she take to arrive at school?

(3)

[8]

QUESTION 5

- 5.1 The following flow diagram is given.



- 5.1.1 Represent the input values and output values in the table below.

x	-2	-1	1	2
y				

(4)

- 5.1.2 Write a number sentence to determine the output values.

(1)

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5.2 Study the table below.

x	1	2	3	4	8	b
y	3	12	27	48	a	243

5.2.1 Determine the relationship between x and y in the table above.

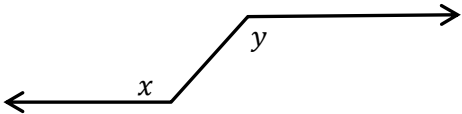
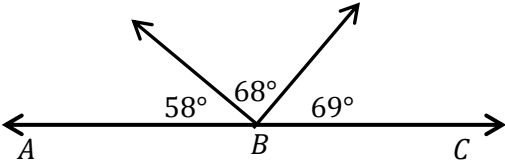
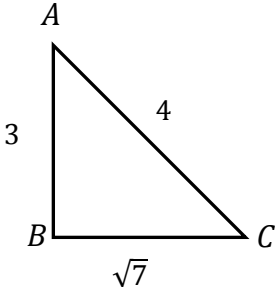
_____ (2)

5.2.2 Hence, determine the values of a and b .

 _____ (5)
 [12]

QUESTION 6

State whether the following statements are “TRUE” or FALSE”.

	STATEMENT	TRUE / FALSE
6.1	Adjacent angles are always supplementary.	
6.2	The sum of the angles in a right-angled triangle is 90° .	
6.3	In the diagram below, x and y are equal alternate angles. 	
6.4	In the diagram below, ABC is a straight line. 	
6.5	 In the diagram above, $\triangle ABC$ is a right-angled triangle.	

[5]

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QUESTION 7

- 7.1 Use a pencil, ruler and a pair of compasses to accurately construct $\triangle DEF$, in which $DE = 5,4$ cm and $EF = DF = 6,7$ cm.

(3)

- 7.2 Use your protractor to measure the size of $\hat{D}$, $\hat{E}$ and $\hat{F}$.

$$\hat{D} = \underline{\hspace{2cm}}^\circ$$

$$\hat{E} = \underline{\hspace{2cm}}^\circ$$

$$\hat{F} = \underline{\hspace{2cm}}^\circ$$

(3)

- 7.3 What kind of triangle is $\triangle DEF$?

(1)

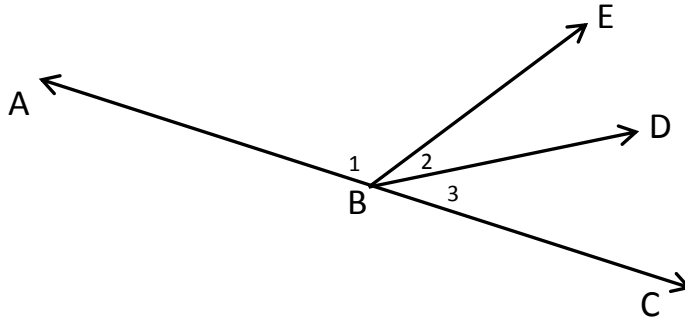
[7]

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QUESTION 8

8.1 ABC is a straight line. DB bisects $E\hat{B}C$ and $\hat{B}_1 = 130^\circ$.

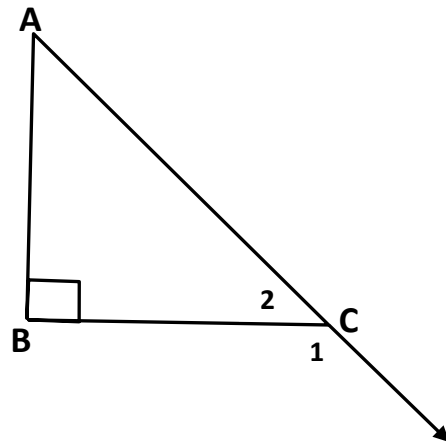


Calculate the size of $\hat{B}_3$.

Statement	Reasons

(3)

8.2 In the diagram below, $AB \perp BC$ and $AB = BC$.



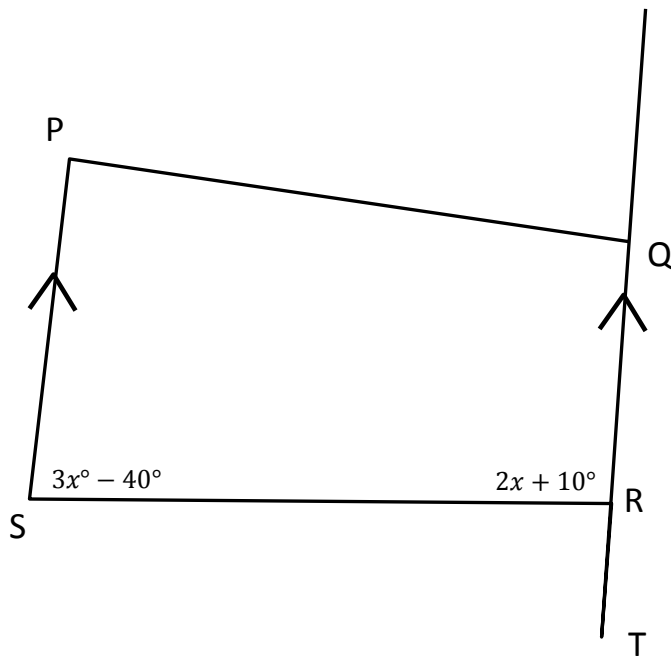
Calculate the size of $\hat{C}_1$.

Statement	Reasons

(5)

P.T.O.

- 8.3 In the diagram below $PS \parallel QT$, $\hat{S} = 3x^\circ - 40^\circ$ and $\hat{QRS} = 2x^\circ + 10^\circ$.



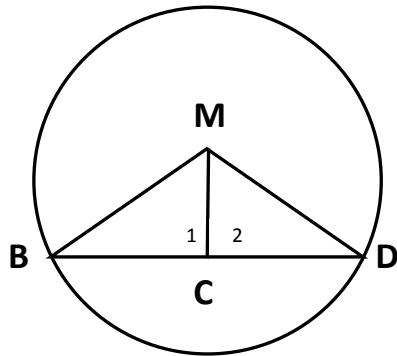
Calculate the size of $\hat{S}$.

Statement	Reasons

(6)

P.T.O.

8.4 M is the centre of the circle below and $BC = CD$.

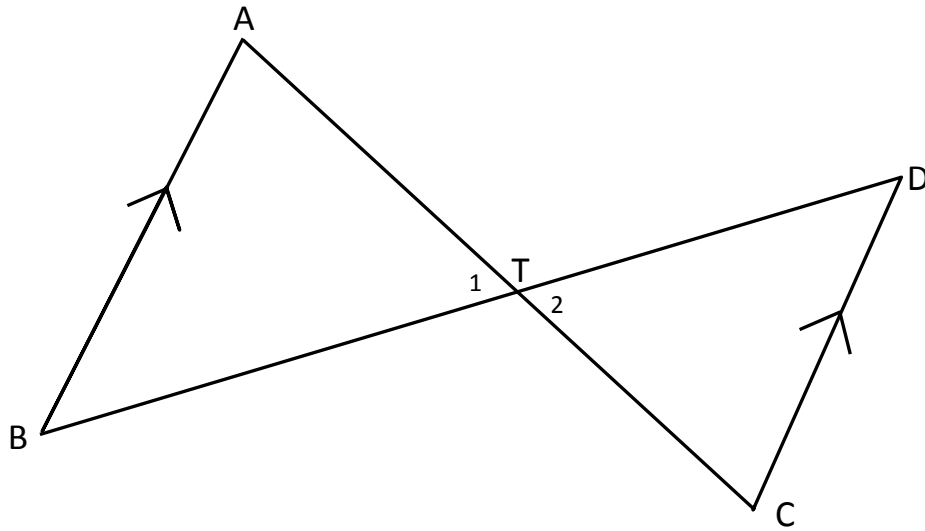


Prove, with reasons, that $\triangle MBC \equiv \triangle MDC$.

Statement	Reasons

(4)

8.5 In the figure below, $AB \parallel DC$, $AB = 10$ cm, $CD = 6$ cm and $CT = 8$ cm.



8.5.1 Prove, with reasons, that $\triangle ABT \parallel \triangle CDT$.

Statement	Reasons

(4)

8.5.2 Calculate the length of AT .

Statement	Reasons

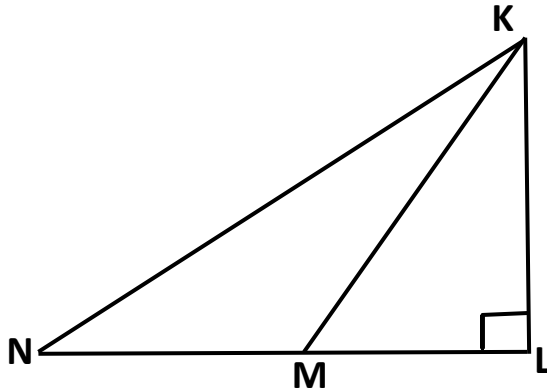
(3)

[25]

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QUESTION 9

The area of $\triangle KMN$ is 60 cm^2 , $KM = 10 \text{ cm}$ and $ML = 6 \text{ cm}$.



Calculate the length of MN .

Statement	Reasons

(7)

[7]

TOTAL 100**END**

FORMULA SHEET

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

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