GAUTENG PROVINCE
EDUCATION
REPUBLIC OF SOUTH AFRICA

GAUTENG DEPARTMENT OF EDUCATION

PROVINCIAL EXAMINATION

JUNE 2017

GRADE 9

MATHEMATICS

NAME OF LEARNER: _____

GRADE: _____

TIME: 2 hours

MARKS: 100

10 pages + 1 formula sheet + 1 answer sheet

P.T.O.

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INSTRUCTION AND INFORMATION

Read the following instructions carefully before answering the questions.

1. This question paper consists of 6 questions and 12 pages, including the attached FORMULA SHEET and the ANSWER 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 the answers correctly according to the numbering system used in this question paper.

8. Write neatly and legibly.

SECTION A

QUESTION 1

Use the ANSWER SHEET to answer this question. Circle the letter of the correct answers from the 4 options given.

1.1 Which one of the following is a rational number?

A $\sqrt{39}$

B $\sqrt{16}$

C $\sqrt{-9}$

D $\sqrt{15}$ (1)

1.2 The ... of 64 is 8.

A Irrational number

B Square root

C Cube root

D Integer (1)

1.3 If $\frac{2x}{3} = -2$, then $x =$

A 9.

B -3.

C 6.

D -4. (1)

1.4 Which one of the following options is NOT a property of congruency?

A S,<,S

B S, S, S

C <, <, <

D 90°, H, S (1)

1.5 The following numbers are written in scientific notation.

$2{,}4 \times 10^{-2}$ $-2{,}4 \times 10^{2}$ $5{,}6 \times 10^{-3}$ $3{,}4 \times 10^{1}$

Which one of the following is arranged in ascending order?

A	$-2{,}4 \times 10^{2}$	$2{,}4 \times 10^{-2}$	$3{,}4 \times 10^{1}$	$5{,}6 \times 10^{-3}$
B	$2{,}4 \times 10^{-2}$	$-2{,}4 \times 10^{2}$	$5{,}6 \times 10^{-3}$	$3{,}4 \times 10^{1}$
C	$2{,}4 \times 10^{-2}$	$-2{,}4 \times 10^{2}$	$3{,}4 \times 10^{1}$	$5{,}6 \times 10^{-3}$
D	$-2{,}4 \times 10^{2}$	$5{,}6 \times 10^{-3}$	$2{,}4 \times 10^{-2}$	$3{,}4 \times 10^{1}$

(1)

1.6 It takes 9 men 8 days to paint a big wall. How long will it take 6 men to paint the same wall?

A 7 days

B 4 days

C 12 days

D 3 days

(1)

1.7 Evaluate $(-3xy^2)^2$

A $-6x^2y^2$

B $-9x^2y^2$

C $9x^2y^4$

D $6x^2y^2$ (1)

1.8 Study the pattern below and determine the terms represented by m and n:

2; 5; 8; m; … ; 17; n; …

A $m = 10$; $n = 13$

B $m = 11$; $n = 21$

C $m = -9$; $n = 20$

D $m = 11$; $n = 20$

(1)

1.9 Simplify: $(x - 2)^2$ =

A $x^2 - 4$.

B $x^2 - 2x + 4$.

C $x^2 + 4$.

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

1.10 An exterior angle of a triangle is equal to ...

A the sum of the two interior opposite angles.

B the difference of the two interior angles.

C the product of the two interior angles.

D the sum of all the angles of a triangle. (1)

[10]

SECTION B

QUESTION 2

2.1 Simplify and leave your answers with positive exponents where possible.

2.1.1 $-a^2b + 3ab^2 + 2a^2b - 4ab^2$ (1)

2.1.2 $2(x + y) + 4(3x - 2y) - 4(2x - 3y)$ (2)

2.1.3 $\dfrac{(2a^2b^3)^2(2a^{-2}b)^3}{4a^6b^{-1}}$ (4)

2.1.4 $\sqrt[3]{\dfrac{-27x^3}{64}}$ (2)

2.2 Solve for x by solving the following exponents.

2.2.1 $5(x - 2) = 3x - 4$ (3)

2.2.2 $3^{x-1} = 81$ (3)

2.2.3 $\dfrac{x}{3} + \dfrac{x}{4} = 1$ (3)

2.3 Determine the value of $x^2 - (2xy)^3$ if $x = -1$ and $y = 2$. (3)

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QUESTION 3

3.1 A top of the range TV costs R50 000. The dealer offers you two payment options.

Option 1: 20% deposit and the balance paid back over 36 months (3 years) at 12% simple interest per annum.
Option 2: No deposit, but the product needs to be paid-off over 42 months (3½ years) at 9% compound interest per annum.

3.1.1 Calculate the deposit amount, if option 1 is chosen. (2)

3.1.2 Calculate the total amount that you will pay on the TV after the 36 months (3 years) if you choose option 1. (Include the deposit.) (4)

3.1.3 Calculate the total amount that you will pay for the TV if you choose option 2. (4)

3.1.4 Which option will you choose, and why? (2)

3.2 The exchange rate of the Rand (R) to the Singapore Dollar (S$) is R1 : S$ 0,1923.

3.2.1 Calculate the Rand value that you will receive for S$ 1. (1)

3.2.2 Calculate

(a) S$ 550 in Rands. (2)

(b) the number of DVDs that you will be able to buy at R100 if you have S$ 550 spend. (2)

[17]

QUESTION 4

Examine the table below and answer the questions that follow.

N	**1**	**2**	**3**	**4**	**5**	**6**
T_n	**10,25**	**10,5**	**10,75**	**11**	**11,25**	

4.1 Determine the 6^{th} term in the pattern. (2)

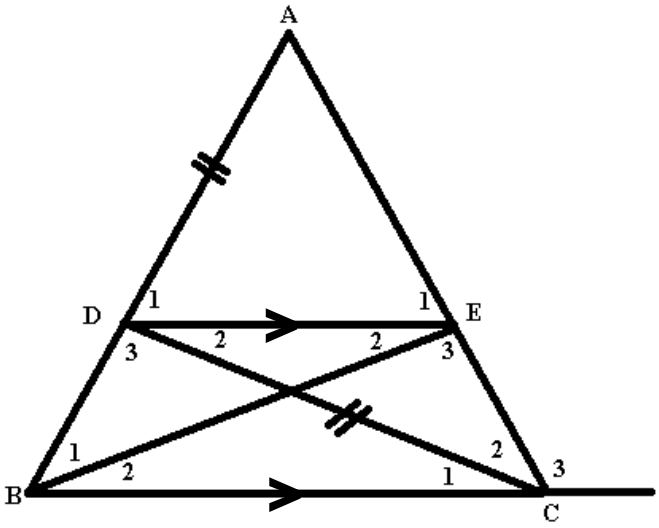
4.2 Write down the rule for the above sequence in your own words. (2)

4.3 If $T_n = 25$, calculate the value of n using the rule $T_n = 0,25n + 10$. (3)

[7]

QUESTION 5

5.1 Study the diagram below and answer the questions that follow.



Given: AD=DC; DE//BC

$\hat{D}_2 = 20°$ and $\hat{B}_1 + \hat{B}_2 = 68°$

Determine with reasons, the sizes of the following angles as indicated in the diagram.

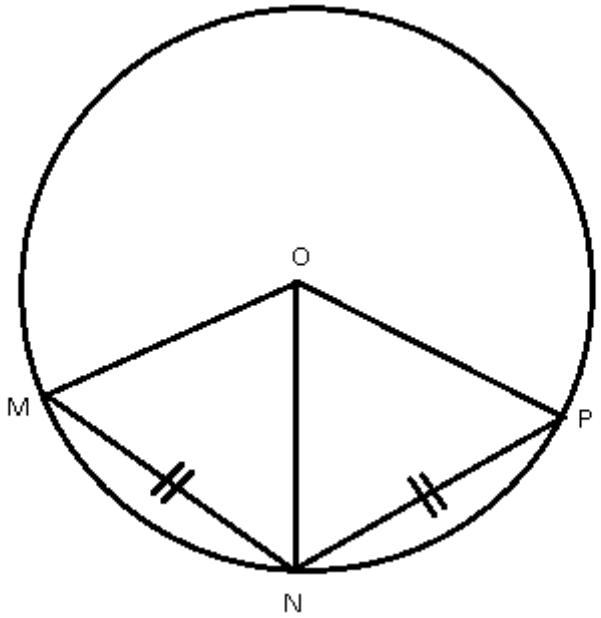
5.1.1 $\hat{C}_1$ (2)

5.1.2 $\hat{D}_3$ (2)

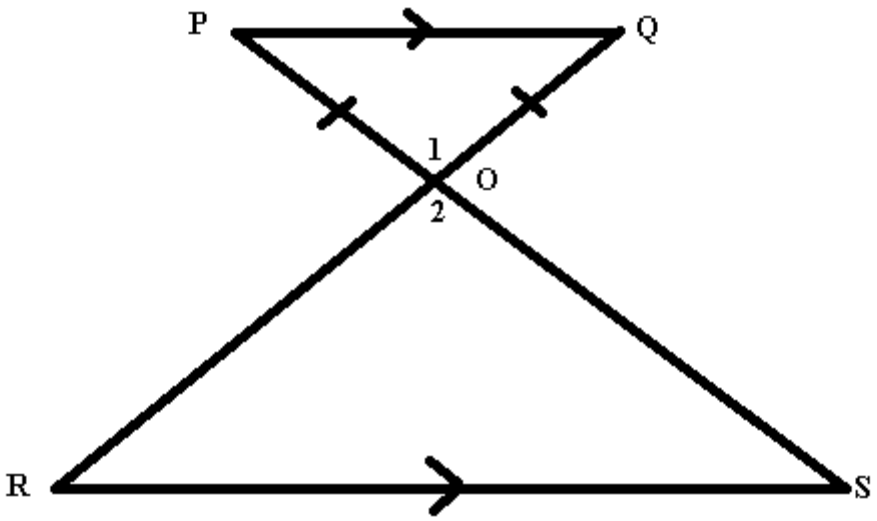
5.1.3 $A\hat{D}C$ (2)

5.1.4 $\hat{C}_3$ (3)

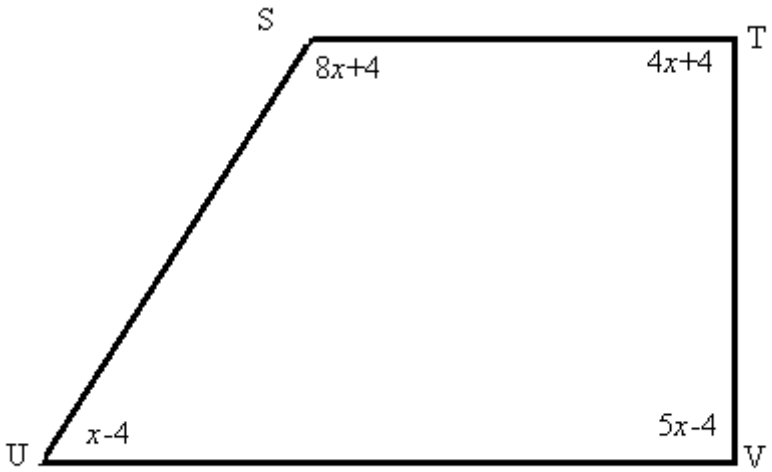
5.2 Given: Circle with centre O and MN = NP in the diagram below.
Prove with reason that ΔMNO≡ΔPNO. (4)



5.3 In the diagram below OPQ is a triangle with OP = QO , PQ//RS and $\hat{O}_1 = 74°$
Prove with reasons that ΔOPQ///ΔOSR. (4)



5.4 In the diagram below, STVU is a quadrilateral with angles in terms of x.



5.4.1 Calculate, with reasons the value for x. (4)

5.4.2 If $x = 20°$, prove with reasons that ST//UV. (4)

5.5 Draw an equilateral triangle with sides of 5 cm without using a protractor. (3)

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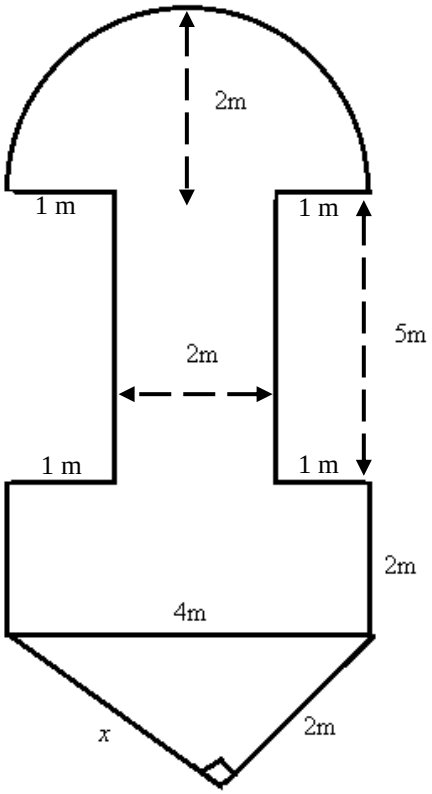
QUESTION 6

Lucas Potgieter High School is hosting their annual Mr and Miss Pottie pageant, where they crown the prettiest and most handsome students in the school.

The diagram below is a top view of the ramp that they will be using to show off their looks and abilities. (Please note that the diagram is NOT drawn to scale.)



USE: $\pi = 3{,}14$

6.1 Calculate, using the Theorem of Pythagoras, the length of x. (3)

6.2 Calculate the perimeter of the entire ramp in metres. (6)

6.3 Calculate the total area (top view) of the ramp. (8)
[17]

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

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Remove this page and hand it in with your ANSWER BOOK.

ANSWER SHEET

QUESTION 1

1.1.	**A**	**B**	**C**	**D**
1.2.	**A**	**B**	**C**	**D**
1.3.	**A**	**B**	**C**	**D**
1.4.	**A**	**B**	**C**	**D**
1.5.	**A**	**B**	**C**	**D**
1.6.	**A**	**B**	**C**	**D**
1.7.	**A**	**B**	**C**	**D**
1.8.	**A**	**B**	**C**	**D**
1.9.	**A**	**B**	**C**	**D**
1.10.	**A**	**B**	**C**	**D**