



Education and Sport Development

Department of Education and Sport Development
Departement van Onderwys en Sport Ontwikkeling
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NORTH WEST PROVINCE

GRADE 10

MATHEMATICS PAPER 1

MID YEAR EXAMINATION 2017

MARKS: 75

TIME: 1 hour 30 minutes

This question paper consists of 4 pages and a diagram sheet

INSTRUCTIONS AND INFORMATION

1. This question paper consists of 5 questions, answer ALL the questions.
2. Clearly show ALL calculations, diagrams, graphs, et cetera that you have used in determining the answers.
3. An approved scientific calculator (non-programmable and non-graphical) may be used, unless stated otherwise.
4. If necessary, answers should be rounded off to TWO decimal places, unless stated otherwise.
5. A diagram sheet for answering QUESTION 5.2 is attached at the end of this question paper.
6. Number the answers correctly according to the numbering system used in this question paper.
7. It is in your own interest to write legibly and to present the work neatly.

QUESTION 1

1.1 Given the following numbers: $-\frac{2}{3}$; $0,2727\dots$; $\sqrt{-16}$; $\frac{\pi}{3}$; $\frac{8}{13}$; $\sqrt[3]{9}$, write down:

1.1.1 one non real number (1)

1.1.2 two irrational numbers (2)

1.2 Write the recurring decimal $0,6\dot{3}$ as a fraction, showing all calculations. (4)

1.3 Determine without calculator between which two consecutive integers does $\sqrt{111}$ lie. (2)

[9]

QUESTION 2

2.1 Simplify the following expressions:

2.1.1 $(2x + 3y)(-7x + 4y)$ (2)

2.1.2 $(x + 3)(x^2 - 3x + 9) - (x + 2)^2$ (4)

2.1.3 $\frac{3x^2 - 3}{x^2 - 5x - 6} \div \frac{1 - x}{x - 6}$ (4)

2.1.4 $\frac{3^x - 3^{x-1}}{5 \cdot 3^x - 3^{x+1}}$ (4)

2.2 Factorise the following expressions fully:

2.2.1 $a^2 - 2a - ax + 2x$ (3)

2.2.2 $3y^3 + 192$ (2)

[19]

QUESTION 3

3.1 Solve for x :

3.1.1 $(x + 4)(x - 3) = x(x - 1)$ (4)

3.1.2 $x^2 - 6x - 7 = 0$ (2)

3.1.3 $4 \cdot 3^{x+1} = 972$ (4)

- 3.2 Solve the following inequality and represent the solution graphically:

$$-8 \leq x - 2 < 7 \quad (4)$$

- 3.3 80 toy motorcycles are stored in a storeroom. The toy motorcycles have either 2 wheels or 3 wheels and you know that there are 181 wheels in total. How many 2 wheel and how many 3 wheel motorcycles are there? (5)

- 3.4 A volume of a cone given by: $V = \frac{1}{3}\pi r^2 h$, determine r in terms of V and h (3)

[22]

QUESTION 4

- 4.1 Given the following number pattern: 7; 11; 15; 19;...

- 4.1.1 Determine the formula for the n^{th} term of the sequence (3)

- 4.1.2 Use the formula to determine the 71st term of the sequence (2)

- 4.1.3 Which term of the sequence is equal to 131? (2)

- 4.2 Consider the number pattern: $x + 2$; $2x + 5$; $3x + 8$; ...

- 4.2.1 Write down the next two terms of the sequence (2)

- 4.2.2 Determine the n^{th} term of the sequence (3)

[12]

QUESTION 5

Given: $f(x) = 3^x$ and $g(x) = \frac{3}{x} + 1$

- 5.1 Determine the x - intercept(s) of the graph of g (2)

- 5.2 Sketch the graphs of f and g on the same set of axes on the DIAGRAM SHEET provided. (6)

- 5.3 Write down the range of the graph of f (1)

- 5.4 Write down the equation of p if $p(x) = g(x) + 2$ (2)

- 5.5 Write down the equations of the asymptotes of p (2)

[13]

TOTAL: 75

DIAGRAM SHEET FOR QUESTION 5.2.

Name of learner:.....

