Education and Sport Development

Department of Education and Sport Development
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NORTH WEST PROVINCE

GRADE 10

MATHEMATICS PAPER 1

MID YEAR EXAMINATION 2018

MARKS: 75

TIME: 1 hour 30 minutes

This question paper consists of 5 pages

INSTRUCTIONS AND INFORMATION

1. This question paper consists of 6 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. Number the answers correctly according to the numbering system used in this question paper.
6. It is in your own interest to write legibly and to present the work neatly.

QUESTION 1

Given the following numbers: $7\sqrt{2}$; $0,4\dot{3}$; $\sqrt{-121}$; π^2; $\sqrt[3]{-\frac{1}{27}}$

1.1 Write down two rational numbers (2)

1.2 Use a calculator to write down the value of π^2 rounded off to **two** decimal places (1)

1.3 Write the recurring decimal $0,4\dot{3}$ as a fraction (4)

1.4 Determine between which two consecutive integers does $7\sqrt{2}$ lie? (3)

[10]

QUESTION 2

2.1 Expand the following product:

$(2a-3b)(3a^2+2ab-3b^2)$ (3)

2.2 Factorise fully:

2.2.1 $3x+6y-ax-2ay$ (2)

2.2.2 $3x^2+17x-6$ (2)

2.3 Simplify the following:

2.3.1 $\frac{2^{3n+2}.8^{n-3}}{4^{3n-2}}$ (5)

2.3.2 $\frac{p^3+q^3}{6p^2}\times\frac{3p-3q}{p^2-q^2}$ (4)

[16]

QUESTION 3

3.1 Solve for x:

3.1.1 $3x-5=2(3x-1)$ (3)

3.1.2 $x(x-2)=8$ (4)

3.1.3 $3^{2x+2}=\frac{1}{27}$ (4)

3.2 Solve the following inequality and represent it and graphically:

$$-\frac{1}{3} < \frac{x-1}{6} < \frac{1}{18} \quad (4)$$

3.3 A fruit yoghurt cost R4 more than a plain yoghurt. It is further given that 5 fruit yoghurts and 3 plain yoghurts together cost R84.

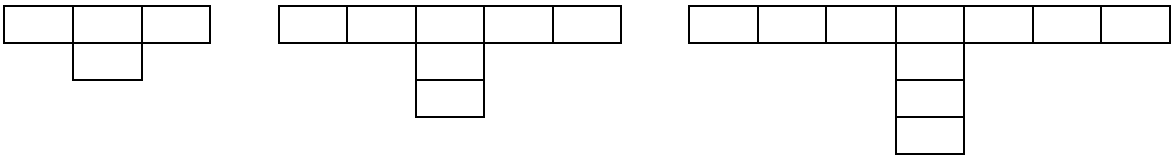
3.3.1 Assign variable x to price of fruit yoghurt and y to price of plain yoghurts and set up a system of equations (2)

3.3.2 Using the above equations, determine the individual prices of the yoghurts (5)

[22]

QUESTION 4

4.1 The diagrams below are made up of blocks:



4.1.1 How many blocks will the 4^{th} diagram have? (2)

4.1.2 Determine the Mathematical formula for the number of blocks required for the n^{th} diagram. (3)

4.1.3 Which diagram will have 70 blocks? (2)

4.2 Study the following illustration:

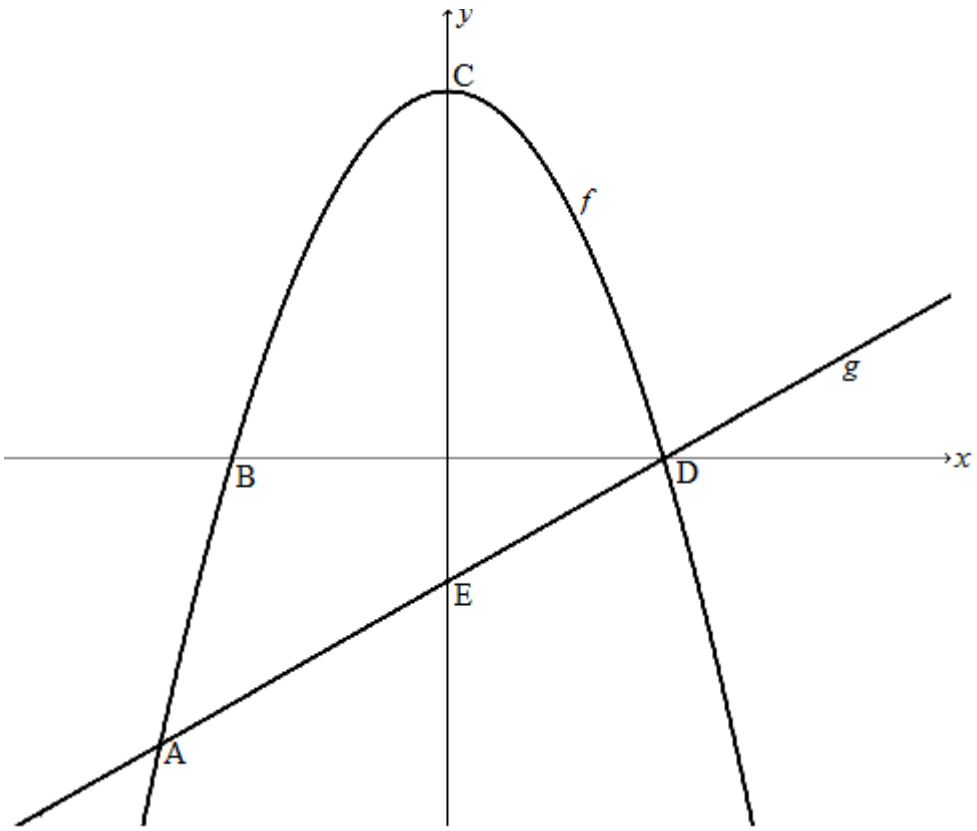
$$88 = 9 \times 9 + 7$$
$$888 = 98 \times 9 + 6$$
$$8888 = 987 \times 9 + 5$$

Express 8888888 as per the illustration above. (2)

[9]

QUESTION 5

5.1 The graphs of $f(x) = -x^2 + 9$ and $g(x) = x - 3$ are drawn:



5.1.1 Calculate the coordinates of C and E, the y – intercepts of the graphs. (3)

5.1.2 Hence or otherwise calculate the length of CE. (2)

5.1.3 Calculate coordinates of A, the point of intersection of the two graphs. (4)

5.2 Draw a sketch of $y = ab^x + q$ where $a > 0, b > 1$ and $q < 0$ (3)

[12]

QUESTION 6

Given: $h(x) = \frac{2}{x} - 1$

6.1 Determine the x – intercept(s) of h. (2)

6.2 Write down the equation of the horizontal asymptote of h (1)

6.3 Draw the graph of $h(x)$ on the system of axes. (3)

[6]

GRAND TOTAL: 75 MARKS