GAUTENG PROVINCE
EDUCATION
REPUBLIC OF SOUTH AFRICA

GAUTENG DEPARTMENT OF EDUCATION

PROVINCIAL EXAMINATION

JUNE 2016

GRADE 10

MATHEMATICS
(PAPER 1)

TIME: 60 minutes

MARKS: 50

4 pages

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INSTRUCTIONS AND INFORMATION

1. Answer ALL the questions.

2. Clearly show ALL calculations, diagrams, graphs etc. that you have used in determining your answers.

3. Answers only will not necessarily be awarded full marks.

4. An approved scientific calculator (non-programmable and non-graphical) may be used, unless stated otherwise.

5. If necessary, answers should be rounded-off to TWO decimal places, unless stated otherwise.

6. Diagrams are NOT necessarily drawn to scale.

7. Number your answers according to the numbering system used in this question paper.

8. It is in your interest to write legibly and to present your work neatly.

QUESTION 1

1.1 Rewrite 0,88 as a common fraction. (1)

1.2 For which value(s) of x is the expression undefined if

$f(x) = \sqrt{\dfrac{9}{11-x}}$ and $x \in \{-5, 0, 11\}$? (1)

1.3 Determine between which two integers the following irrational number lies.

$\sqrt{45}$ (2)

[4]

QUESTION 2

2.1 Simplify:

2.1.1 $(2x+3)(2x^2 - x - 2)$ (2)

2.1.2 $\dfrac{x+3}{x-3} \times \dfrac{x^3 - 27}{x^2 - 9} \times \dfrac{x-3}{x^2 + 3x + 9}$ (3)

2.1.3 $\dfrac{2x^2 y^{-2} \times 8x^{-5} y^8}{(2x^{-2} y^4)^2}$ (3)

2.2 Factorise completely:

2.2.1 $2a^2 + 9a - 5$ (2)

2.2.2 $a^2 + a(4 + b) + 4b$ (3)

[13]

QUESTION 3

3.1 Solve for x:

3.1.1 $(x - a)(x + b) = 0$ (2)

3.1.2 $2^x + 2^{x-1} = 12$ (4)

3.2 Solve for x and represent your answer on a number line if $x = N_0$.
$2(2x - 3) - 18 \geq 2x$ (4)

3.3 Solve for x and y simultaneously:

$2x + y = 6$
$4x + 3y = 10$ (5)

[15]

QUESTION 4

4.1 Given the number pattern: $\dfrac{1}{2}$; $\dfrac{2}{5}$; $\dfrac{6}{8}$; $\dfrac{8}{11}$ ...

4.1.1 Write down the next TWO terms of the pattern. (1)

4.1.2 Determine the general term. (3)

4.2 Given: $T_n = -2n^3$

4.2.1 Determine the 8th term. (1)

4.2.2 Which term is -432? (2)

[7]

QUESTION 5

5.1 Given: $f(x) = x^2 - 2$ and $g(x) = 3^x$

5.1.1 Sketch the graph of $f(x)$ and $g(x)$ on the same system of axes. Clearly indicate all the intercepts on the graph. (4)

5.1.2 For which value(s) of x is $g(x) > 1$? (1)

5.1.3 Write down the range of $f(x)$. (1)

5.1.4 Describe in words the transformation of $f(x)$ to $h(x) = (x - 2)(x + 2)$. (2)

5.2 Determine the equation of the function $g(x) = \dfrac{a}{x} + q$, with the asymptote $y = -2$. The straight line $f(x) = -x$ intersects the graph of $g(x)$ at the point $(5; -5)$. (3)

[11]

TOTAL: 50

END