GAUTENG PROVINCE
EDUCATION
REPUBLIC OF SOUTH AFRICA

GAUTENG DEPARTMENT OF EDUCATION

PROVINCIAL EXAMINATION

JUNE 2019

GRADE 10

MATHEMATICS

(PAPER 1)

TIME: 1 hour
MARKS: 50

4 pages

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INSTRUCTIONS AND INFORMATION:

1. This question paper consists of FOUR questions.
2. Answer ALL the questions.
3. Clearly show ALL calculations, diagrams, graphs etc. which were used in determining the answers.
4. Answers only will not necessarily be awarded full marks.
5. An approved scientific calculator (non-programmable and non-graphical) may be used, unless otherwise stated.
6. Where necessary, answers should be rounded off to TWO decimal places, unless otherwise stated.
7. Diagrams are NOT necessarily drawn to scale.
8. Number your answers according to the numbering system used in this question paper.
9. Write neatly and legibly.

QUESTION 1

1.1 Simplify the following:

1.1.1 $(5x+1)(2x^2-3x-1)$ (3)

1.1.2 $\dfrac{9^{x+1}.5^{x+2}}{45^{x+1}}$ (3)

1.2 Factorise fully:

1.2.1 $2x^2+3x-5$ (2)

1.2.2 $-3(-3x^4y)^2-(-3x^2y^2)^3+12x^2-12y^4$ (6)

[14]

QUESTION 2

2.1 Solve for x:

2.1.1 $x(x-4)=12$ (3)

2.1.2 $\dfrac{x-3}{1-x^2}-\dfrac{2x+4}{x+1}=\dfrac{-2x}{x-1}$ (5)

2.1.3 $2^x-2^{x-1}=4$ (3)

2.2 Given: $-2\leq -2x-1<3$

2.2.1 Solve for x. (3)

2.2.2 Rewrite your answer using interval notation. (1)

2.2.3 Illustrate your answer on a number line for $x\in\mathbb{R}$. (1)

2.3 The sum of the squares of two consecutive natural numbers is 85. Determine the numbers. (4)

[20]

QUESTION 3

Consider the general term $T_n = \frac{1}{3n+1}$.

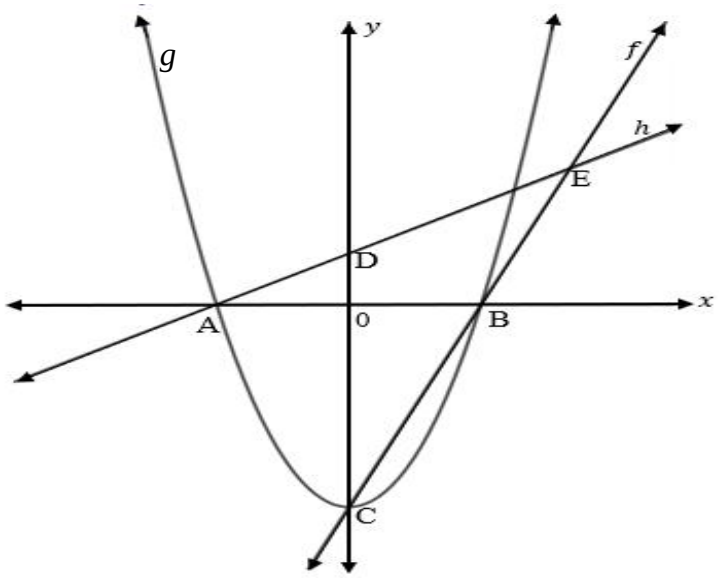
3.1 Write down the first TWO terms of the sequence. (2)

3.2 Determine which term in the sequence has a value of $\frac{1}{325}$. (2)

[4]

QUESTION 4

Sketched below are the graphs of $f(x) = 2x - 4$; $g(x) = ax^2 - q$ and $h(x) = mx + c$.
A and B are the $x-$intercepts and C is the turning point of g. B is the $x-$intercept and C is the $y-$intercept of f, A is the $x-$intercept and D is the $y-$intercept of h.



4.1 Determine the equation of g. (3)

4.2 Show that the equation of h is $y = \frac{1}{2}x + 1$ if the length of CD = 5 units. (3)

4.3 Determine the coordinates of E, the point of intersection of f and h. (3)

4.4 Write down the range of g. (1)

4.5 For which value(s) of x is $f(x) \geq g(x)$? (2)

[12]

TOTAL: 50

END