

education

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**RUSTENBURG LOCAL EDUCATION
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GRADE 10

**MATHEMATICS PRE --TEST
JUNE 2024**

Stanmorephysics.com

MARKS: 50

TIME: 1 Hour

This question paper consists of 4 pages.

INSTRUCTIONS AND INFORMATION

Read the following instructions carefully before answering the questions.

1. This question paper consists of 4 questions.
2. Answer ALL the questions.
3. Clearly show ALL calculations, diagrams, graphs, et cetera that you have used in determining your answers.
4. Answers only will NOT necessarily be awarded full marks.
5. You may use an approved scientific calculator (non-programmable and non-graphical), unless stated otherwise.
6. If necessary, round off answers to TWO decimal places, unless stated otherwise.
7. Diagrams are NOT necessarily drawn to scale
8. An information sheet with formulae is included at the end of the question paper.
9. Write neatly and legibly.



QUESTION 1

Determine the following **without the use of a calculator**.

1.1 Between which two consecutive integers lies $-\sqrt{69}$ (2)

1.2 Show that $0,9\dot{9} = 1$ (3)

[5]

QUESTION 2

2.1 Factorise the following expression:

$$3x^2 + 9x - 2xy - 6y \quad (2)$$

2.2 Simplify:

2.2.1 $\frac{m^2 - 64}{m^2 + 8m} \div \frac{m - 8}{m}$ (4)

2.2.2 $\frac{2^{n-1} \cdot 8^{n+1}}{16^n}$ (3)

[9]

QUESTION 3

Solve for the unknown variable in each of the following:

3.1 $(a + 1)(a^2 + 2a - 3) = a(a^2 + 3a)$ (3)

3.2 $2x^2 + x - 3 = 0$ (2)

3.3 Solve the inequality

$$3 \leq 2x - 1 < 7 \quad (2)$$

3.4 Solve for x and y simultaneously

$$3^{x+2} = 27$$

$$2^y = 4^{x+12}$$

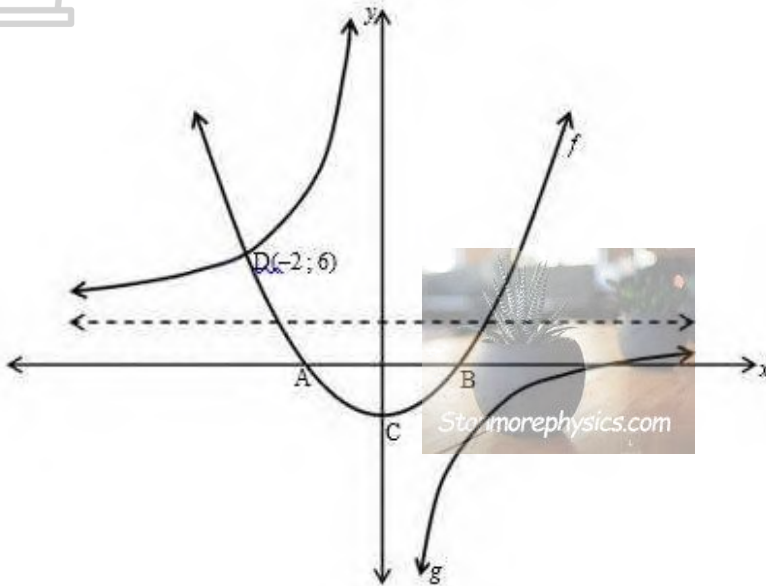
(4)

[11]

QUESTION 4

The graph of $f(x) = 2x^2 - 2$ and $g(x) = \frac{k}{x} + \frac{3}{2}$ are drawn below.

A and B are the x -intercepts of f and C is the y -intercept. $D(-2; 6)$ is a point of intersection between the two graphs.



- 4.1 Write down the:
 - 4.1.1 Domain of $g(x)$ (2)
 - 4.1.2 Range of f (2)
 - 4.1.3 Equation of the horizontal asymptote of g (1)
- 4.2 Calculate the length of AB (3)
- 4.3 Show that $k = 9$ (2)
- 4.4 Write down the equation of the line of symmetry of g , with a positive gradient. (2)
- 4.5 Write down the value(s) of x such that :
 - 4.5.1 $g(x) > f(x)$ (2)
 - 4.5.2 Both f and g increases as x increases (1)
- 4.6 Describe the transformation of g to h if $h(x) = \frac{9}{x} - 3,5$ (2)

[17]

QUESTION 5

Given : $h(x) = 2^x - 4$

5.1 Calculate the x-intercept of h . (2)

5.2 Calculate the y-intercept of h (1)

5.3 Hence, sketch the graph of h on a system of axes clearly showing
Intercepts with the axes and asymptote. (3)

5.4 Write down the point of intersection between $y = 2^x - 4$ and $y = \frac{1}{2^x} - 4$ (2)

[8]

GRAND TOTAL : 50

