Province of the
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EDUCATION

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NATIONAL SENIOR CERTIFICATE

BUFFALO CITY METRO DISTRICT

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GRADE 10

MATHEMATICS TEST

21-08-2025

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MARKS : 50
Time : 1 Hour

This question paper consists of 6 pages with diagram sheet.

INSTRUCTIONS AND INFORMATION:

Read the following instructions carefully before answering the questions.

1. This paper consists of **FOUR QUESTIONS**.
2. Answer **ALL** the questions.
3. Clearly show ALL calculations, diagrams, graphs, etc. 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 answers off to **TWO** decimal places, unless stated otherwise.
7. Diagrams are **NOT** necessarily drawn to scale.
8. Write neatly and legibly.

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QUESTION 1

Given the equation: $h(x) = \frac{-2}{x} + 2$

1.1 Determine the *x*-intercept of h. (2)

1.2 Calculate the *y*-intercept of h. (2)

1.3 Write down the equation of asymptotes of h. (2)

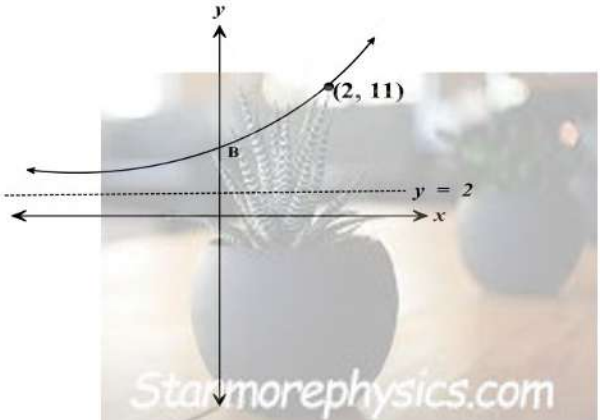
1.4 Hence, sketch the graph of *h*. Clearly show all intercepts with the axes and asymptotes. (3)

[9]

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QUESTION 2

The graph of $f(x) = a^x + b$ is drawn below. B is the y intercept of *f*.



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Use the above graph to answer the following questions:

2.1 Write down the equation of asymptote of *f*. (1)

2.2 Determine the values of *a* and *b*. (3)

2.3 Write down the range of *f*. (1)

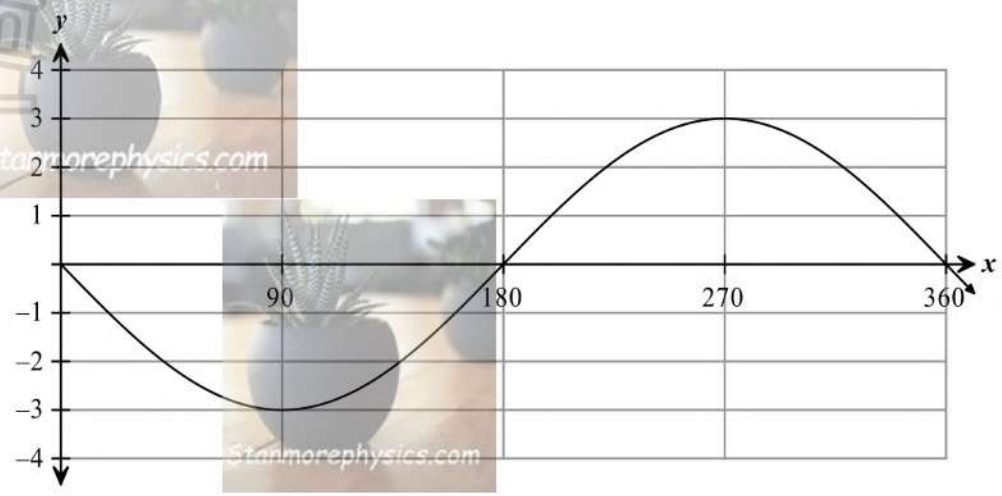
2.4 Determine the coordinates of B. show all your workings. (2)

2.5 Determine the equation of *t*, if $t(x) = 3f(x) - 1$. (3)

[10]

QUESTION 3

In the diagram below, the graph of $f(x) = -3sinx$ is drawn for the interval of $0° \leq x \leq 360°$



3.1 Write down the amplitude of *f*. (1)

3.2 Write down the minimum value of $f(x) + 5$ (1)

3.3 One the same set of axes, draw the graph of p, $p(x) = tanx$ for the interval $0° \leq x \leq 360°$ (3)

3.4 Use the graph to determine the following:

3.4.1 The value of $f(90°) - p(180°)$ (3)

3.4.2 Determine the equations of asymptotes of *p*. (2)

3.4.3 For which values of *x* is $p(x) \leq 0$ (4)

3.5 The graph of *f* is reflected about x-axis and then moved 2 units upwards to form the graph of *k*. Determine:

3.5.1 The equation of *k*. (2)

3.5.2 The range of *k* for the interval $0° \leq x \leq 360°$ (2)

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QUESTION 4

4.1 Given the equation of $r(x) = 2cosx - 1$

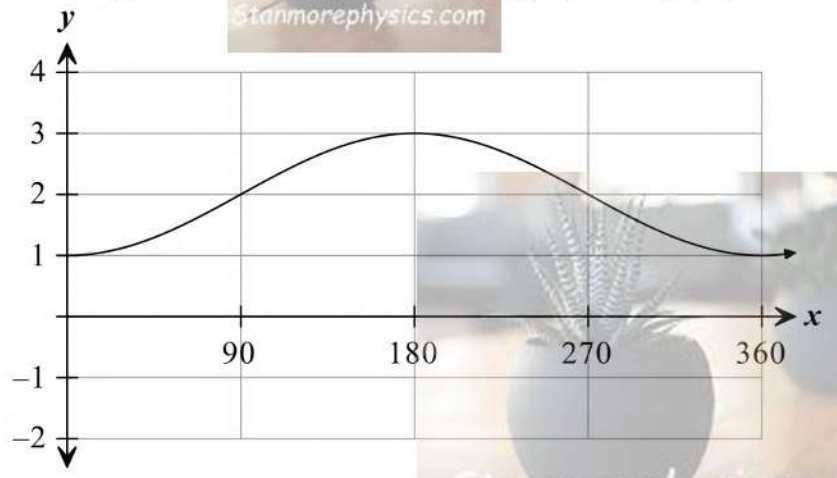
4.1.1 Sketch the graph of r on the provided grid, for $x \in [0°; 360°]$ (3)

4.1.2 Write down the period of r. (1)

4.1.3 Determine the maximum value of r. (1)

4.1.4 Determine the range of r. (2)

4.2 The diagram below represents the graphs of $f(x) = acosx + q$



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4.2.1 Write down the values of a and q. (2)

4.2.2 Using the graph for which values of x is f a decreasing function. (1)

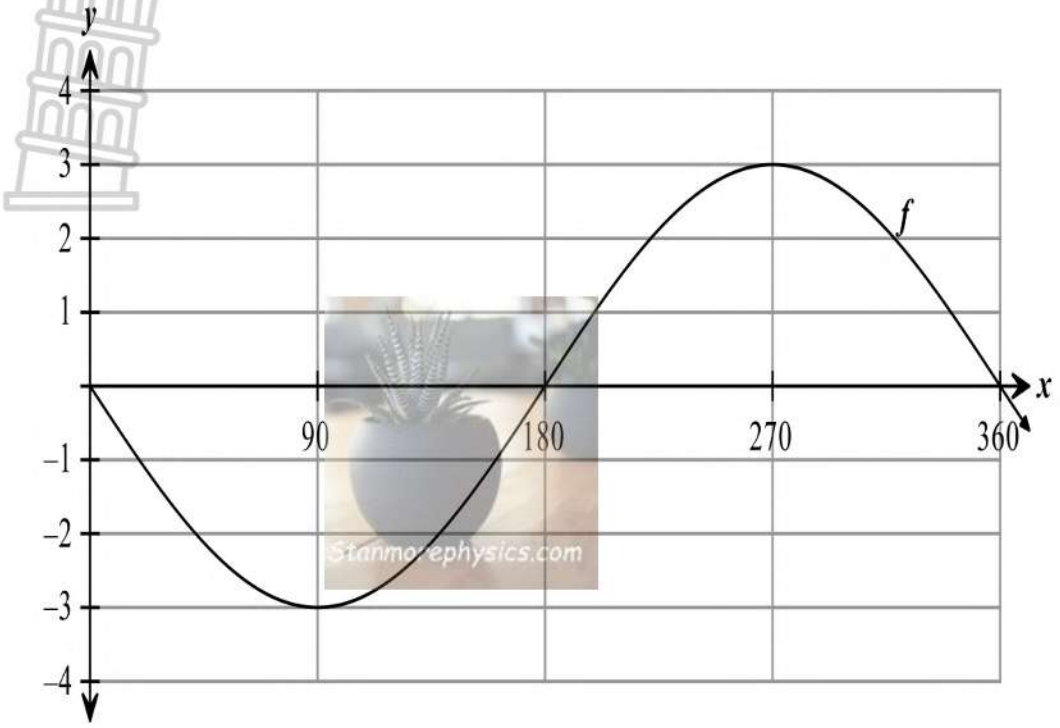
4.2.3 For which values of x is $f(x) \geq 2$ (2)

4.2.4 Write down the minimum value of f, if f is shifted 3 units downwards. (1)

[13]

LEARNER NAME:

QUESTION 3.3



QUESTION 4.1.1

