education

DEPARTMENT: EDUCATION
MPUMALANGA PROVINCE

NATIONAL SENIOR CERTIFICATE EXAMINATION

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MATHEMATICS

GRADE 11

CONTROLLED TEST

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17 MARCH 2025

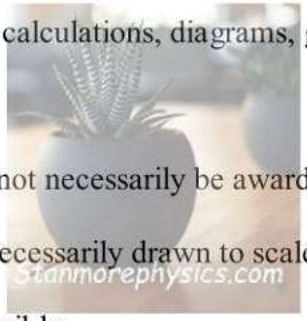
MARKS: 50

TIME: 60 Minutes

This question paper consists of 4 pages including the cover page.

Read the following instructions carefully before answering the questions.

1. The questions paper consists of three questions: QUESTION 1 TO QUESTION 3.
2. Answer ALL questions in all sections.
3. Number the answers correctly according to the numbering system used in this question paper.
4. Clearly show ALL calculations, diagrams, graphs, etc, that you have used in determining your answers.
5. Answers only will not necessarily be awarded full marks.
6. Diagrams are not necessarily drawn to scale
7. Write neatly and legibly.



QUESTION 1

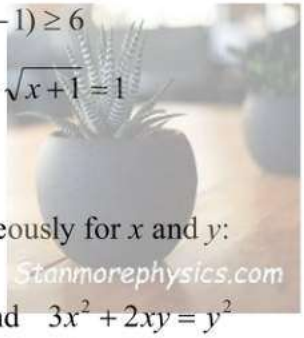
1.1 Solve for x:

1.1.1 $x^2 - 2x = 8$ (3)

1.1.2 $4x^2 - x - 2 = 0$ (answer correct to TWO decimal places) (3)

1.1.3 $x(x-1) \geq 6$ (4)

1.1.4 $2x + \sqrt{x+1} = 1$ (5)



1.2 Solve simultaneously for x and y:

$4x + y = 7$ and $3x^2 + 2xy = y^2$ (6)

1.3 The roots of a quadratic equation are $x = \dfrac{-3 \pm \sqrt{13-2k}}{4}$.

Calculate the values of k for which the root(s) are equal (2)

1.4 Given: $(x+5)^2 = 1 - p^2$

Calculate the values of p for which the roots of the equation are non-real (5)

[28]

QUESTION 2

2.1 **Simplify the following without using a calculator**. Your answers must be free of negative exponent and irrational exponents.

2.1.1 $\dfrac{3^{2n+2}-9^{n-1}}{2.3^{2n+1}}$ (5)

2.1.2 $\dfrac{(3-\sqrt{3})^2}{\sqrt{3}.\sqrt{6}}$ (4)

2.2 **Solve for *x*, without using a calculator.**

2.2.1 $\sqrt[x]{32}=128$ (4)

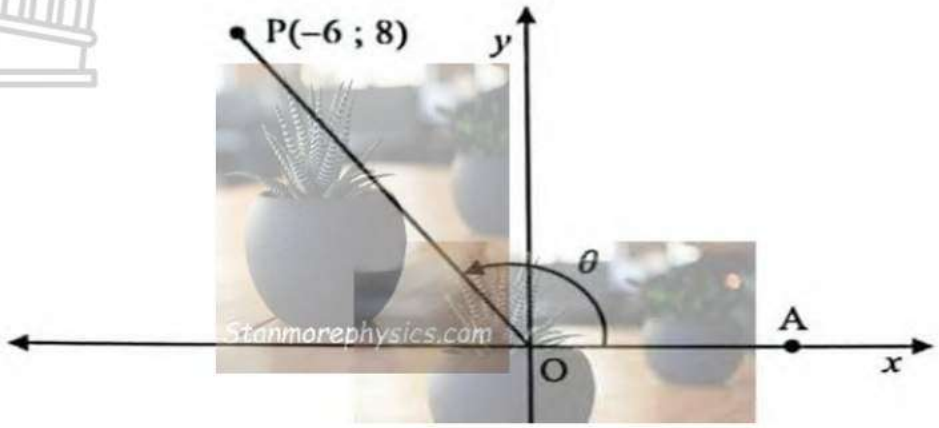
2.2.2 $x^{\frac{1}{2}}-3x^{\frac{1}{4}}-10=0$ (4)

[17]

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QUESTION 3

3.1 In the diagram below, P (-6; 8) is a point in the Cartesian plane. A is the point on the positive x-axis. $\angle AOP = \theta$.



Determine, with the aid of a diagram, the following:

3.1.1 The length of OP. (2)

3.1.2 $\tan\theta$ (1)

3.1.3 $\sin\theta + \cos\theta$ (3)

[6]

TOTAL **[50]**