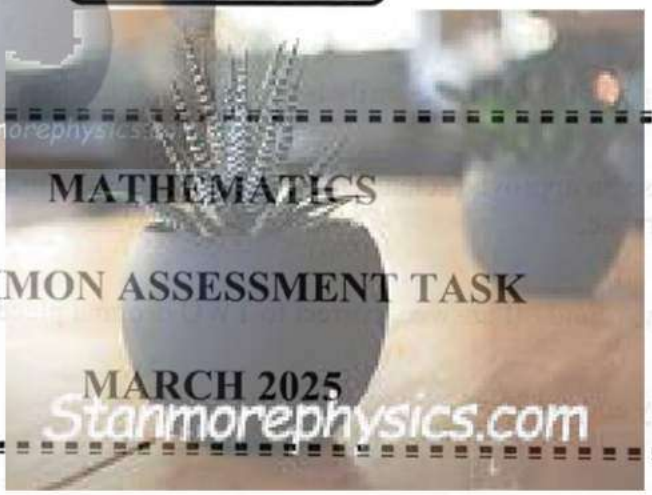
KWAZULU-NATAL PROVINCE
EDUCATION
REPUBLIC OF SOUTH AFRICA

NATIONAL SENIOR CERTIFICATE

GRADE 10



MATHEMATICS

COMMON ASSESSMENT TASK

MARCH 2025

MARKS: 75

TIME: $1\frac{1}{2}$ hours

This question paper consists of 5 pages.

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INSTRUCTIONS AND INFORMATION

Read the following instructions carefully before answering the questions.

1. This question paper consists of 3 questions.
2. Answer ALL the questions.
3. Number the answers correctly according to the numbering system used in this question paper.
4. Clearly show ALL calculations, diagrams, graphs, etc. which you have used in determining your answers.
5. Answers only will NOT necessarily be awarded full marks.
6. You may use an approved scientific calculator (non-programmable and non-graphical), unless stated otherwise.
7. If necessary, round off answers correct to TWO decimal places, unless stated otherwise.
8. Write neatly and legibly.

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QUESTION 1

1.1 If $x \in \{0\ ;7\ ;9\}$, choose the value of x from the given set that will make the expression of $\sqrt{x-5}$ be:

1.1.1 Rational (1)

1.1.2 Irrational (1)

1.1.3 Non-real (1)

1.2 Between which two consecutive integers does $\sqrt{170}$ lie? Show all working details without the use of a calculator. (2)

1.3 Simplify the following fully:

1.3.1 $(x-2y)(x^2+2xy+4y^2)$ (2)

1.3.2 $(5-4x)^2$ (2)

1.3.3 $\frac{3}{x^2-9}+\frac{2}{x-3}-\frac{1}{x+3}$ (4)

1.3.4 $\frac{10^{2x+3}\ .\ 4^{1-x}}{25^{2+x}}$ (4)

1.4 Factorise the following expressions fully:

1.4.1 $2x^2-18$ (2)

1.4.2 $8+125a^3$ (3)

1.4.3 $x^3-2x^2+5x-10$ (3)

1.5 If $2^x=3$, evaluate:

1.5.1 2^{-x} (1)

1.5.2 8^x (2)

1.5.3 $\left(\frac{1}{16}\right)^x$ (3)

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QUESTION 2

2.1 Solve for x

2.1.1 $3x(x-8)=0$ (2)

2.1.2 $7x^2-5x-2=0$ (3)

2.1.3 $3^{5x-4}-729=0$ (3)

2.1.4 $2x^{\frac{-3}{2}}=128$ (4)

2.1.5 $2^{x+1}+2^{x-1}=20$ (5)

2.2 If $\left(a^3+2a^{-3}\right)^2=\left(a^3-2a^{-3}\right)^2+b$, calculate the value of b. (4)

2.3 Given: $-9\le -2x+3<5$

2.3.1 Solve for x. (2)

2.3.2 Represent the solution of 2.3.1 on a number line. (2)

2.4 Solve for x and y simultaneously:

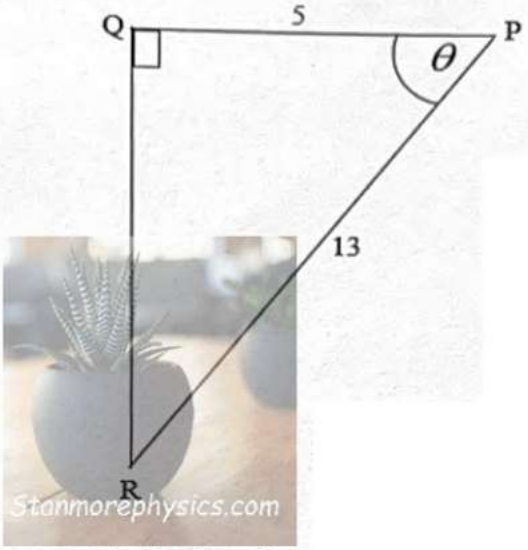
$2x-y=17$
$4y+3x=9$ (4)

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QUESTION 3

3.1 In the diagram below, ΔPQR is a right-angled triangle, $\hat{Q} = 90°$, $\hat{P} = \theta$, $PQ = 5$ units and $PR = 13$ units.



3.1.1 Determine the numerical value of:

(a) QR (2)

(b) $\cos\theta$ (1)

(c) $\cot\theta$ (1)

(d) $\sec Q\hat{R}P$ (1)

3.1.2 Write down the trigonometric ratio that is equal to $\frac{QR}{PR}$. (1)

3.2 If $\hat{A} = 34°$ and $\hat{B} = 53°$, use your calculator to evaluate the following (correct to TWO decimal places).

3.2.1 $\cos(B - A)$ (2)

3.2.2 $\sin^2 B$ (2)

3.3 Without using a calculator, determine the value of:

$$\frac{\text{cosec}45° \cdot \sin 60°}{\sin 45° \cdot \cos 30°}$$ (5)

TOTAL: [15] 75

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