LIMPOPO

PROVINCIAL GOVERNMENT

REPUBLIC OF SOUTH AFRICA

DEPARTMENT OF

EDUCATION

NATIONAL

SENIOR CERTIFICATE

GRADE 11

MATHEMATICS

MARCH TEST

2025

Stanmorephysics.com

MARKS : 100

DURATION : 2 HOURS

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 SIX 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, et cetera that 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 to TWO decimal places, unless stated otherwise.
8. Diagrams are NOT necessarily drawn to scale.
9. Write neatly and legibly.

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QUESTION 1

1.1 Simplify without using a calculator:

1.1.1 $\dfrac{9x^{-2}}{27x^{-3}}$ (2)

1.1.2 $\dfrac{8^x.6^{x-1}}{27^{\frac{x}{3}}.16^x}$ (4)

1.1.3 $\left(0,25x^4y^8\right)^{-\frac{1}{4}}$ (3)

1.1.4 $\dfrac{a^{-2}-b^{-2}}{b^2-a^2}$ (3)

1.2 Simplify: $\sqrt[3]{\left(\sqrt{13}-\sqrt{5}\right)^6}.\sqrt[3]{\left(\sqrt{13}+\sqrt{5}\right)^6}$ (5)

1.3 Simplify: $\dfrac{x-3}{x+3}-\dfrac{x+3}{x^2-9}$ (5)

[22]

QUESTION 2

Solve for x:

2.1 $(3x-5)(x+1)=0$ (2)

2.2 $x^2-3x=0$ (2)

2.3 $\dfrac{x}{2x+1}=\dfrac{2}{x+3}$ (5)

2.4 $2x^2+7x=2$ (correct to two decimal places) (4)

2.5 $x^{\frac{2}{3}}=4$ (4)

2.6 $\sqrt{x-3}-4=5$ (4)

2.7 $9^x+9=10.3^x$ (5)

[26]

QUESTION 3

3.1 Solve for x in the following inequalities:

$2x^2-2\geq 3x$ (4)

3.2 Solve for x and y for the following simultaneous equations:

$y-2x=-1$ and $2y^2+4xy=6x^2$ (6)

3.3 Show that the roots of $m^2+mx-12=0$ will be real and unequal if $m>0$ (4)

[14]

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QUESTION 4

4.1 If θ is a reflex angle and $\tan\theta = -\frac{3}{4}$, determine without the use of a calculator and the with the aid of a diagram, value of:

4.1.1 $\sin\theta$ (4)

4.1.2 $\cos(180° - \theta)$ (2)

4.2 If $\sin 17° = a$, WITHOUT using a calculator, express the following in terms of a:

4.2.1 $\tan 17°$ (3)

4.2.2 $\sin 107°$ (2)

4.2.3 $\cos^2 253° + \sin^2 557°$ (4)

[15]

QUESTION 5

5.1 Simplify the following fully, WITHOUT the use of a calculator:

$$\frac{\cos(-225°).\sin 135° + \sin 330°}{\tan 225°}$$ (6)

5.2 Simplify the following fully:

$$\frac{\sin(180° - A).\tan A.\sin(90° + A)}{\tan(180° + A).\sin(-A).\cos(-A)}$$ (6)

[12]

QUESTION 6

6.1 Prove that: $(\sin x + \cos x)^2 = 1 + 2\sin x.\cos x$ (3)

6.2 Given: $\frac{\sin x}{1+\cos x} + \frac{\cos x}{\sin x} = \frac{1}{\sin x}$

6.2.1 Prove the given identity. (5)

6.2.2 For what values of x in the interval $0° \le x \le 360°$ will the identity be undefined? (3)

[11]

TOTAL: 100 MARKS

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