MABOPANE AND WINTERVELD PLC

GRADE 11

MATHEMATICS: CONTROL TEST (TERM 1)

24 MARCH 2026

MARKS: 75

TIME: 2 hours

EXAMINER: RAPHADU T.M

INTERNAL MODERATOR: SEGOLE O.I

EXTERNAL MODERATOR: SHONGWE S.S

This question paper consists of 5 pages

INSTRUCTIONS AND INFORMATION

Read the following instructions carefully before answering the questions

1. This question paper consists of FIVE questions. Answer ALL the questions in the ANSWER SHEET.

2. Start EACH question on a NEW page in the ANSWER SHEET.

3. Number the answers correctly according to the numbering system used in this question paper.

4. Clearly show ALL calculations, diagrams, graphs etcetera that you have used in determining your answers

5. You may use a non-programmable calculator.

6. Show ALL formulae and substitutions in ALL calculations.

7. Round off your final numerical answers to a minimum of TWO decimal places, if necessary

8. Write neatly and legibly.

QUESTION 1

1.1 Solve for x

1.1.1 $x(x-2)+7(x-2)=0$ (3)

1.1.2 $5x^2+2x-6=0$ (Correct to two decimals) (3)

1.1.3 $15x-4<9x^2$ (4)

1.1.4 $9^x+9=10.3^x$ (5)

1.2 Solve the following equations simultaneously:

$\frac{x}{2}+\frac{3}{2}y=1$ and $y^2+x=xy+y$ (6)

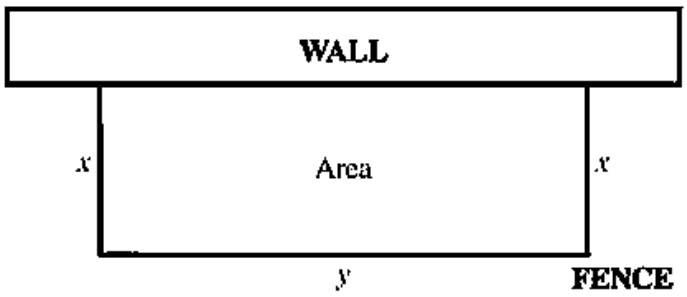
1.3 Consider the equation: $x=\frac{4\pm\sqrt{16-4m(-m+5)}}{2m}$

For which value(s) of m will the equation $x=\frac{4\pm\sqrt{16-4m(-m+5)}}{2m}$ have non-real? (5)

[26]

QUESTION 2

A rectangular area is to be enclosed on three sides by a fence and an existing wall which forms the fourth side. The perimeter of the fence is 100 m



2.1 If $y=100-2x$, show that the area of the wall and the fence is given by:
$A=-2x^2+100x$ (2)

2.2 Determine the maximum possible area that can be enclosed between the wall and the fence (4)

[6]

QUESTION 3

3.1 Simplify the following without the use of a calculator.

3.1.1 $64^{-\frac{2}{3}}$ (3)

3.1.2 $\frac{3^{2n+2}-9^{n-1}}{2.3^{2n+1}}$ (4)

3.1.3 $(\frac{\sqrt{7^{2011}}-\sqrt{7^{2009}}}{\sqrt{7^{2008}}}+\sqrt{7})^2$ (5)

[12]

QUESTION 4

4.1 If $\tan\theta=-\frac{3}{4}$ & $\theta\varepsilon[180°\,;360°]$, determine without the use of a calculator and with the aid of a diagram, value of:

4.1.1 $\sin\theta$ (3)

4.1.2 $\cos(180°-\theta)$ (2)

4.2 If $sin17°=a$, without the use of a calculator, express the following in terms of a

4.2.1 $tan17°$ (3)

4.2.2 $\sin n107°$ (2)

4.2.3 $cos^2253°+sin^2557°$ (4)

[14]

QUESTION 5

5.1 Simplify as far as possible:

$$\frac{\cos(-180°-x).\tan(360°-x)cos^2(90°-x)}{\sin(180°-x).sinx}$$ (6)

5.2 Prove that:

$$\frac{sinx}{1+cosx} = \sqrt{\frac{1-cosx}{1+cosx}}$$ (5)

5.3 Determine the general solutions for the equation:

$$3cos^2x - 5sinx = 1$$ (6)

[17]

TOTAL = 75 MARKS