

SOSHANGUVE PLC

GRADE 11

MATHEMATICS: PAPER 1

JUNE EXAMINATION

03 JUNE 2026

MARKS: 100

EXAMINER: VUMA L

TIME: 2 hours

MODERATOR: SHONGWE S.S

This question paper consists of 7 pages

INSTRUCTIONS AND INFORMATION

Read the following instructions carefully before answering the questions

1. This question paper consists of SEVEN 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 11.1 Solve for x

$$1.1.1 \quad x^2 - 3x - 28 = 0 \quad (3)$$

$$1.1.2 \quad 6\left(1 + \frac{2}{3}x\right) = 3x^2 \quad (\text{answer correct to TWO decimal places}) \quad (4)$$

$$1.1.3 \quad 2x^2 + x - 3 \geq 0 \quad (4)$$

$$1.1.4 \quad 2x^{\frac{1}{3}} = 3 \quad (3)$$

$$1.1.5 \quad (5^x - 125)(5^x + 1) = 0 \quad (3)$$

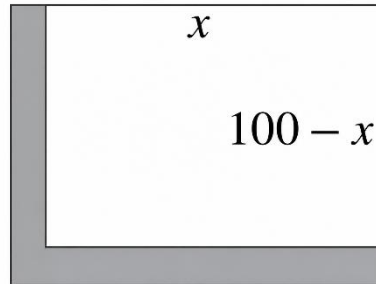
1.2 Given $\sqrt{x-3} = \frac{2}{\sqrt{x}}$ 1.2.1 solve for x . (5)1.2.2 Hence, or otherwise, solve for k if $\sqrt{k-20} = \frac{2}{\sqrt{k-17}}$ (2)1.3 Solve for x and y :

$$2x - y = 3 \quad \text{and} \quad x^2 - 15 = -5xy - y^2 \quad (6)$$

[30]

QUESTION 2

A farmer has 100 metres of wire fencing from which to build a rectangular chicken run. He intends using adjacent walls for two sides of the rectangular enclosure.



Determine:

2.1 The enclosed area in terms of x (2)

2.2 The maximum enclosed area and the corresponding value of x (5)

[7]

QUESTION 3

3.1 An equation is given as $\frac{1}{2}x^2 + mx + 18 = 0$

3.1.1 Solve for x in terms of m . (2)

3.1.2 Hence, otherwise, determine the value(s) of m for which the above equation will have equal roots. (3)

3.2 If $P = \frac{(x-2)(2x-1)}{3-x}$, for which value(s) of x will P be?

3.2.1 Equal to zero (2)

3.2.2 Undefined (2)

[9]

QUESTION 4

4.1 Evaluate the following expressions, without using a calculator:

$$4.1.1 \quad \frac{\sqrt{121x^2} - \sqrt[3]{27x^3}}{-4^0 x} \quad (3)$$

$$4.1.2 \quad \frac{8^k \cdot 6^{k-3} \cdot 9^{1-k}}{16^{k-1} \cdot 3^{-k}} \quad (4)$$

4.2 Calculate p and q if $\sqrt{\frac{7^{2014} - 7^{2012}}{12}} = p(7^q)$ and p is not a multiple of 7 (4)

[11]**QUESTION 5**

Given: $f(x) = \frac{-3}{x+2} + 1$ and $g(x) = 2^{-x} - 4$

5.1 Write down the asymptotes of f . (2)

5.2 Write down the range of g . (1)

5.3 Determine the coordinates of the x and y intercepts of f . (5)

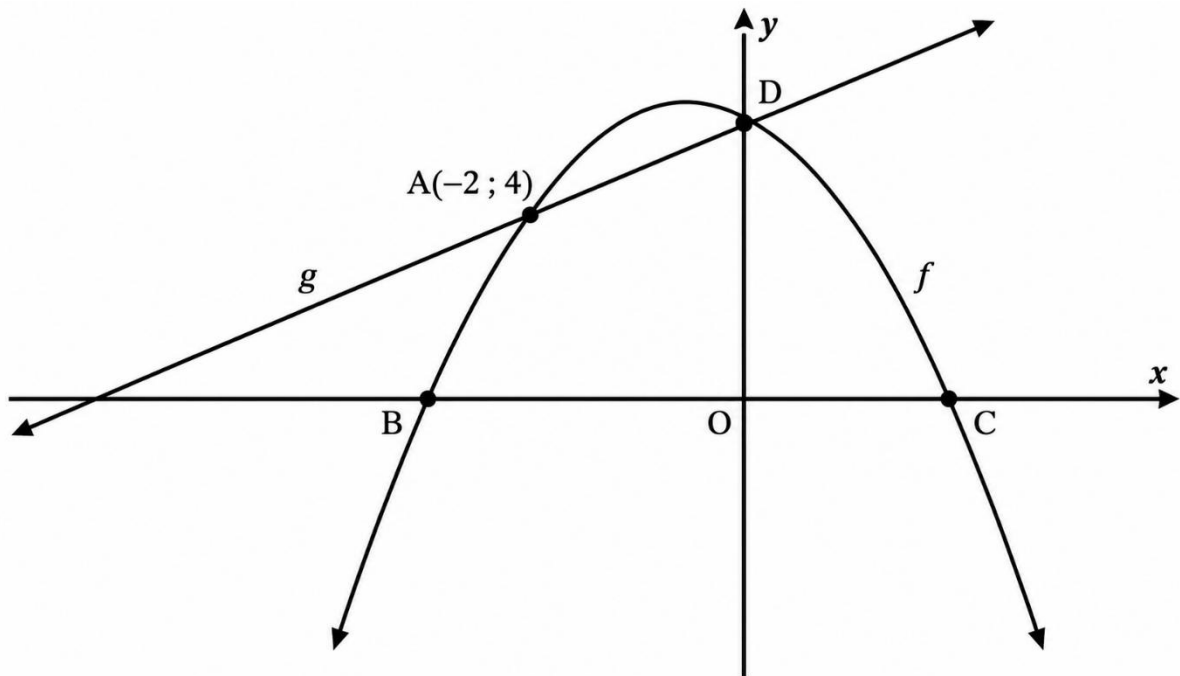
5.4 Determine the equation of the axis of symmetry of f which has a negative gradient. leave your answer in the form of $y = mx + c$. (2)

5.5 Sketch the graphs of f and g on the same system of axis.
Clearly show ALL intercepts with the axes and any asymptotes. (6)

[16]

QUESTION 6

The diagram below shows the graphs of $f(x) = -x^2 - x + 6$ and $g(x) = mx + c$.
 $A(-2; 4)$ is a point of intersection of the graphs.

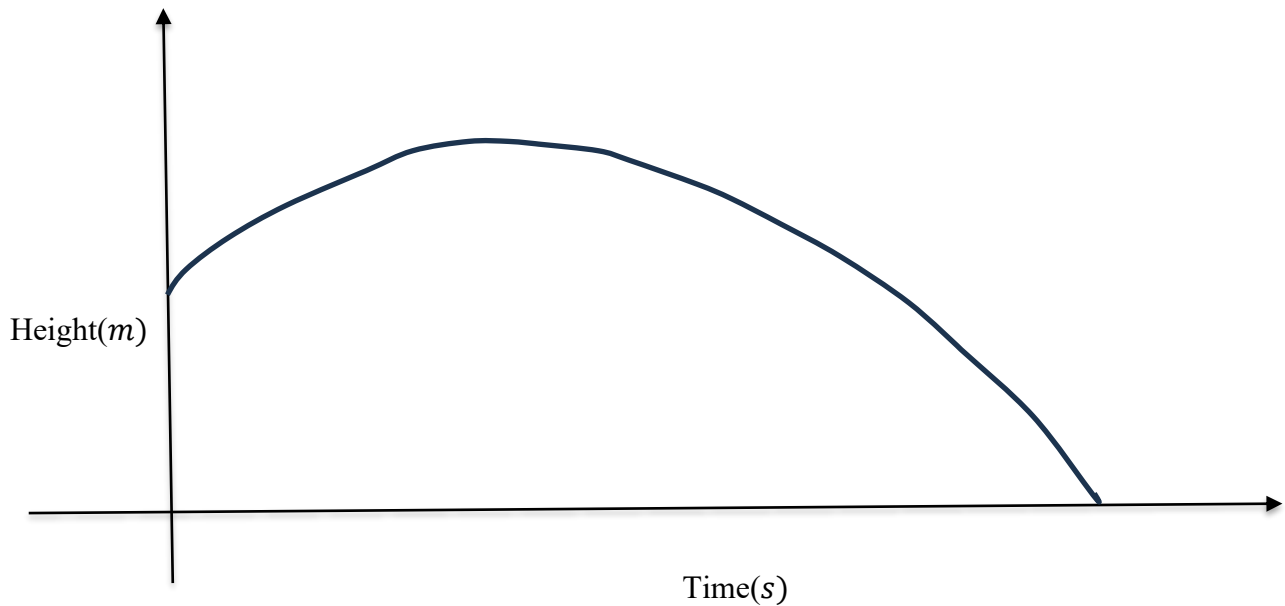


- 6.1 Determine the x intercepts of f . (3)
- 6.2 Write the equation of axis of symmetry of f . (2)
- 6.3 Determine the range of f . (3)
- 6.4 Write the equation of g in the form of $g(x) = mx + c$. (3)
- 6.5 Determine the equation of h , if h is the reflection of f about the x -axis and then translated 3 units to the right.
 Leave your answer in the form $h(x) = a(x + p)^2 + q$. (3)
- 6.6 Write down the values of x for which $f(x) > 0$. (2)
- 6.7 If $f(p) = f(r) = 4$, calculate the value of $p - r$ if $r < 0$. (4)

[20]

QUESTION 7

A grade 11 mathematics learner builds a rocket and launches it from the roof of his school. He determines that the height above the ground from the moment it was launched can be modelled by the function $H(t) = -5t^2 + 20t + 20$, which is sketched below:



- 7.1 Determine the Height of the school roof. (2)
(hint: this is the height the rocket was launched from.)
- 7.2 Determine the Rocket's maximum height above the ground. (3)
- 7.3 Determine the time it took the rocket to pass its initial height. (2)

[7]**TOTAL = 100 MARKS**