education

Department:
Education
North West Provincial Government
REPUBLIC OF SOUTH AFRICA

PROVINCIAL ASSESSMENT

GRADE 11

MATHEMATICS P1

JUNE 2024

MARKS: 100

TIME: 2 hours

This question paper consists of 6 pages and an answer sheet.

INSTRUCTIONS AND INFORMATION

Read the following instructions carefully before answering the questions.

1. This question paper consists of 5 questions.

2. Answer ALL the questions.

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

4. An ANSWER SHEET is provided for Question 3.

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

6. Answers only will NOT necessarily be awarded full marks.

7. You may use an approved scientific calculator (non-programmable and non-graphical), unless stated otherwise.

8. If necessary, round off answers to TWO decimal places, unless stated otherwise.

9. Diagrams are NOT necessarily drawn to scale.

10. Write neatly and legibly.

QUESTION 1

1.1   Solve for x :

     1.1.1 $x(x - 3) = 40$ (3)

     1.1.2 $3x^2 - 2x - 4 = 0$ (3)

     1.1.3 $\sqrt{x - 3} + 1 = \dfrac{12}{\sqrt{x-3}}$ (6)

     1.1.4 $2 - 16x^{-\frac{3}{2}} = 0$ (4)

     1.1.5 $9^{2x} + 9 = 10 \cdot 3^{2x}$ (6)

1.2   Solve for x and y simultaneously if:

     $x - 3y = 1$ .... ①

     and

     $x^2 - 2xy + 9y^2 = 17$ ....② (6)

1.3   The solutions of the equation $ax^2 + bx + c = 0$; $a \neq 0$ is given by

$$x = \frac{3 \pm \sqrt{9 + 16a}}{2a}$$

     1.3.1   Give the values of b and c. (2)

     1.3.2   Give ONE value of a for which the roots of the equation will be rational. Motivate your answer. (2)

1.4   Given : $A = \dfrac{\sqrt{x^2 - 2x - 3}}{x + 5}$

     Calculate the value(s) of x for which:

     1.4.1   A is non-real (4)

     1.4.2   A is undefined (1)

1.5   Determine the value of n if n is the largest integer for which

$$n^{500} < 6^{200}$$ (3)

[40]

QUESTION 2

2.1 Simplify en calculate **without using a calculator**:

2.1.1 $\dfrac{\sqrt{3}}{\sqrt{3}+1}$ (answer with rational denominator) (3)

2.1.2 $\dfrac{5^{3n+5}}{125^{n+1}}$ (3)

2.1.3 $-5\sqrt{48a^8} + 3\sqrt{27a^8}$ (4)

2.1.4 $\dfrac{4 \cdot 5^x - 2 \cdot 5^{x+1}}{5^{x-1} - 5^x}$ (4)

2.1.5 $\sqrt{\dfrac{2^{2020}+2^{2025}}{33(2)^{2014}}}$ (4)

2.2 Calculate the following **without using a calculator**. Clearly show ALL calculations:

$1234567893 \times 1234567894 - 1234567895 \times 1234567892$ (3)

[21]

QUESTION 3 (answer on answer sheet)

Given: $h(x) = \dfrac{-4}{x+2} - 4$

3.1 Determine the equations of the asymptotes of h. (2)

3.2 Determine the coordinates of the x- and y-intercepts of h. (3)

3.3 Draw the graph of h. Clearly indicate on your graph the asymptotes and ALL intercepts with the axes. (4)

3.4 Use the graph to determine for which value(s) of x will

$$\dfrac{-4}{x+2} \geq 4$$

(2)

[11]

QUESTION 4

The graph of $f(x) = a.b^x + q$ $(a \neq 0)$ are shown in the diagram below. The x- and y-intercepts of the graph are $(-1 ; 0)$ and $(0 ; -3)$ respectively. The asymptote of f is $y = -6$.
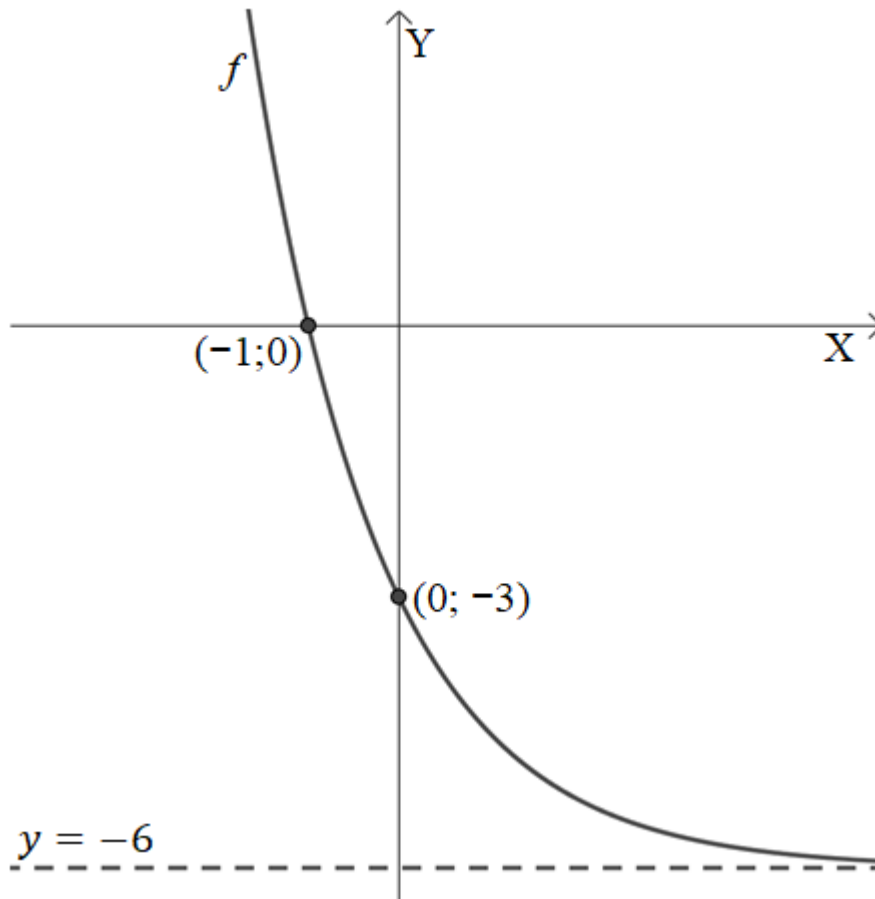

4.1   Write down the range of f.   (1)

4.2   Determine the values of a, b and q.   (5)

4.3   Determine the value of x if $f(x) = 18$.   (4)

4.4   If g is the reflection of f in the x-axis, write down the equation of g.   (2)

[12]

QUESTION 5

The graphs of $f(x) = -x - 2$ and $g(x) = x^2 - 6x - 16$ are g sketched below.
- The graphs intersect at A and Q.
- A and B are the x-intercepts of g.
- D is the turning point of g.
- F and E are the y-intercepts of f and g respectively.
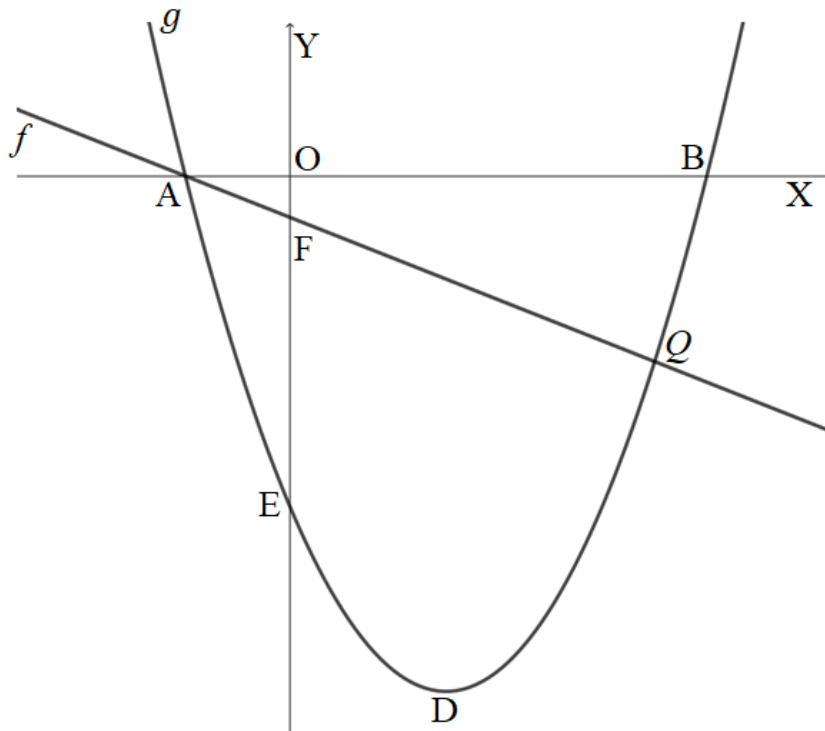
5.1   Calculate the length of AB.   (3)

5.2   Calculate the coordinates of the turning point, D.   (3)

5.3   Calculate the coordinates of Q.   (4)

5.4   Use the graphs to determine:

        5.4.1   for which value(s) of x is $f(x) > g(x)$ (2)

        5.4.2   for which value(s) of x is $f(x) \cdot g(x) \leq 0$ (2)

        5.4.3   for which value(s) of k will $x^2 - 6x + k = 0$ have two unequal,
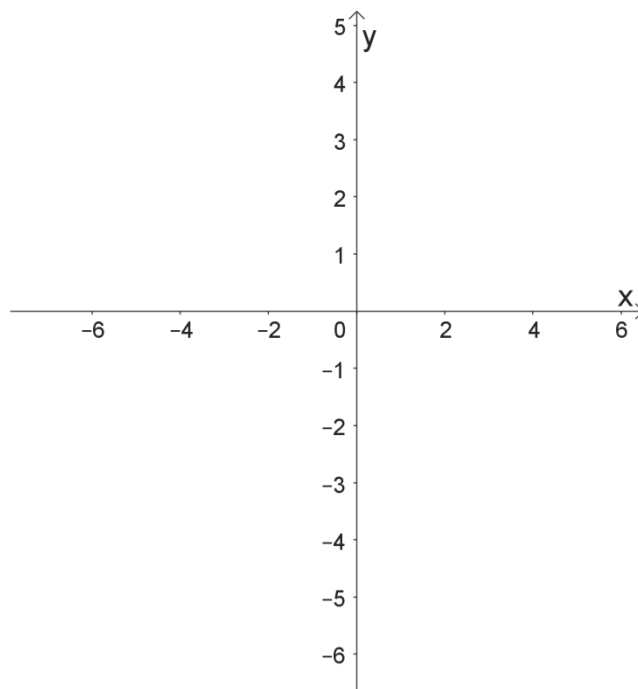   positive roots.   (2)
                                                                                       [16]

                                                                    TOTAL: 100

NAME:_____

ANSWER SHEET

QUESTION 3

3.1

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3.2

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3.3

3.4

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