education

Department:
Education
North West Provincial Government
REPUBLIC OF SOUTH AFRICA

PROVINCIAL ASSESSMENT

GRADE 10

MATHEMATICS P1

NOVEMBER 2024

MARKS: 100

TIME: 2 hours

This question paper consists of 7 pages, 1 diagram sheet and 1 information sheet.

INSTRUCTIONS AND INFORMATION

Read the following instructions carefully before answering the questions.

1. This question paper consists of 9 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. 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 answers off to TWO decimal places, unless stated otherwise.
8. Diagrams are NOT necessarily drawn to scale.
9. ONE diagram sheet for QUESTION 5.1 is attached at the end of this question paper. Write your NAME and CLASS on this sheet in the spaces provided and attach the sheet to your ANSWER SCRIPTS.
10. An information sheet with formulae is included at the end of the question paper.
11. Write neatly and legibly.

QUESTION 1

1.1 Factorise the following expressions completely.
Leave your answers in simplest form:

1.1.1 $x^2 - 16x + 15$ (1)

1.1.2 $a(6a + 2b) - 3(3a + b)$ (2)

1.2 Simplify the following expressions completely:

1.2.1 $27^{\frac{2}{3}}$ (2)

1.2.2 $\frac{x+3}{x-3} \times \frac{x^3-27}{x^2-9} \div \frac{x^2+3x+9}{x-3}$ (4)

1.2.3 $\frac{3^{x+1} - 3^{x+2}}{3^{x+2} + 3^x}$ (4)
[13]

QUESTION 2

2.1 Solve for x:

2.1.1 $2.3^{2x} = 18$ (4)

2.1.2 $\frac{2x-1}{3} \geq 2x + 1$ (4)

2.1.3 $2x^2 - x - 10 = 0$ (4)

2.2 How much must be added to $(x + 5)(x - 5)$ so that it will be equal to $(x + 1)(x - 25)$? (4)

2.3 Solve for *x* and *y* simultaneously:

$y - 3x = -2$ and $7x - 2y = 8$ (4)
[20]

QUESTION 3

3.1 In each diagram below, there are shaded squares and white squares.

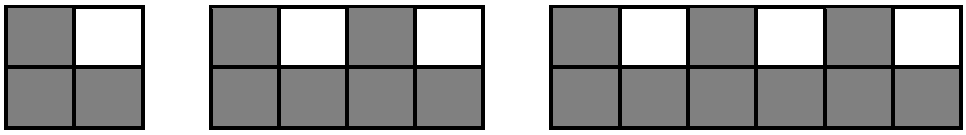


Diagram 1 **Diagram 2** **Diagram 3**

3.1.1 Write down the formula or general term for the number of shaded squares. (1)

3.1.2 Determine the number of shaded squares of diagram 300. (2)

3.1.3 Which diagram will consist of 1 500 shaded squares? (2)

3.2 If the pattern TERMSTERMS... continue on the same way, what will be the 383rd letter? (3)

3.3 Consider the following pattern: 8 ; 15 ; 22 ; 29 ; ... ...

3.3.1 Write down the next two terms of the pattern. (2)

3.3.2 Describe the pattern in your own words. (2)

[12]

QUESTION 4

4.1 Mark has booked himself a hotel room for three nights during his visit to New York. The exchange rate during his visit was \$1 = R 9,10. The cost per night of the hotel was \$450. How much did the three nights cost him in rands? (3)

4.2 A television set costs R 20 000. Belinda buys it on hire purchase. She traded in an old television for R 3 000 and also paid a deposit of R 2 000. She made monthly installments of R 900 for a period of 2 years.

4.2.1 Calculate the total interest paid. (6)

4.2.2 Calculate the simple interest rate. (4)

[13]

QUESTION 5

5.1 Sketch the graphs of $f(x) = -x^2 + 4$ and $g(x) = 2^x + 3$ on the same set of axes on the diagram sheet provided. (5)

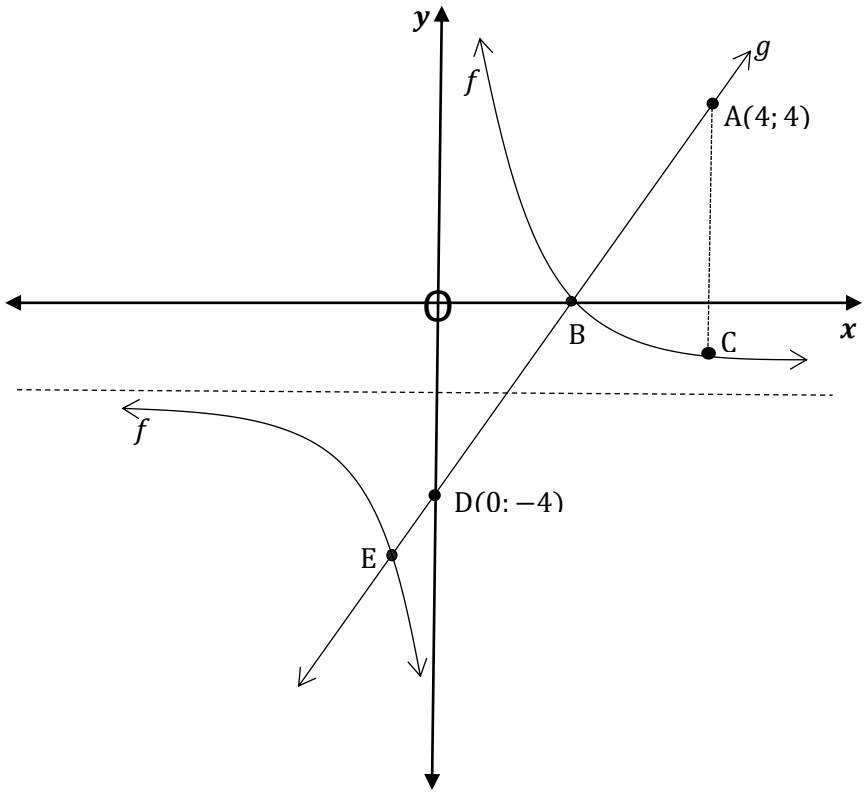
5.2 Write down the coordinates of the turning point of f. (1)

5.3 The graph of $h(x) = x^2 - 4$ is obtained by transforming the graph of f. Describe the transformation that maps the graph of f onto the graph of h. (2)

[8]

QUESTION 6

The graphs of $f(x) = \frac{4}{x} - 2$ and $g(x) = mx + c$ are drawn below.
A$(4; 4)$, B, D$(0; -4)$ and E are points on g. B is the x-intercepts of both f and g.
B and E are the points of intersection of f and g. AC is parallel to the y-axis, with C a point on f.



6.1 Determine the values of m and c. (2)

6.2 Write down the range of f. (2)

6.3 Determine the coordinates of the point(s) of intersection of the two graphs algebraically. (4)

6.4 Determine the value(s) of x for which $g(x) \geq f(x)$. (2)

6.5 Calculate the length of AC. (3)

[13]

QUESTION 7

Given the equation of an exponential graph: $h(x) = a.b^x + q$.

The information of the function is known:

- $0 < a < 2; a \in Z$
- The range of h is $y > -2$
- $A(1; 0)$ is a point on the graph.

7.1 Write down equation of the asymptote of h. (1)

7.2 Determine the equation of h. (4)

7.3 Write down the y-intercept of h. (1)

[6]

QUESTION 8

Consider events A and B. $P(A) = 0{,}43$, $P(B) = 0{,}37$ and $P(A\ and\ B) = 0{,}1591$.

8.1 Determine whether events A and B are complimentary. (2)

8.2 Are events A and B mutually exclusive? Explain your answer. (2)

8.3 Draw a Venn diagram to represent the information above. (4)

[8]

QUESTION 9

Two different events, A and B, forms part of an investigation.

- $P(A) = \frac{2}{3}$
- $P(B') = \frac{3}{5}$
- $P(A\ or\ B) = \frac{4}{7}$

Determine the value of:

9.1 $P(not\ A)$. (2)

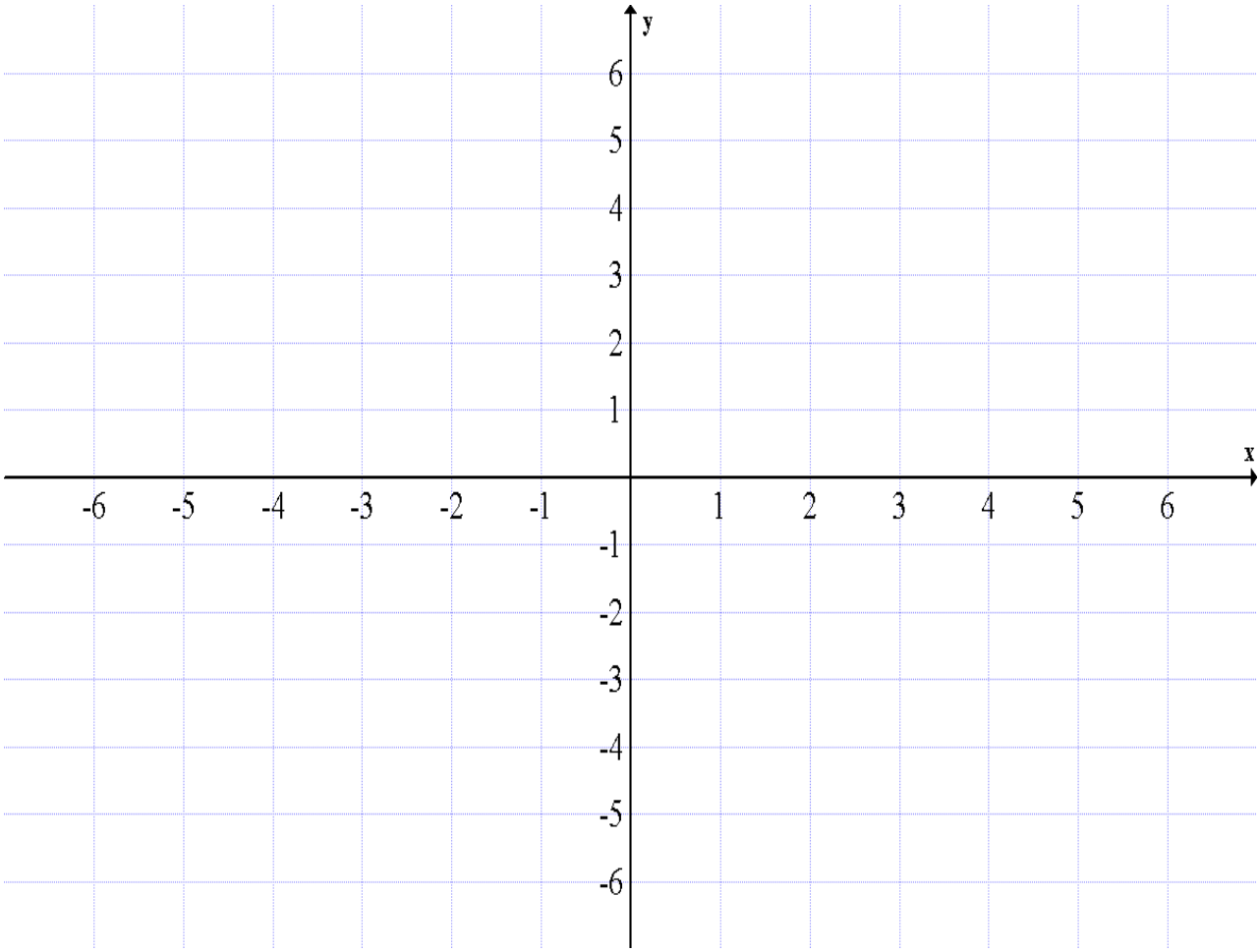
9.2 $P(B)$. (2)

9.3 $P(A\ and\ B)$. (3)
[7]

TOTAL: 100

DIAGRAM SHEET FOR QUESTION 5.1

NAME: _____ CLASS: _____



INFORMATION SHEET: MATHEMATICS GR10

$A = P(1+ni)$ $A = P(1-ni)$ $A = P(1-i)^n$ $A = P(1+i)^n$

$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$ $\text{M}\left(\frac{x_1 + x_2}{2}; \frac{y_1 + y_2}{2}\right)$

$y = mx + c$ $m = \frac{y_2 - y_1}{x_2 - x_1}$

$\bar{x} = \frac{\sum x}{n}$

$P(A) = \frac{n(A)}{n(S)}$ $P(A \text{ or } B) = P(A) + P(B) - P(A \text{ and } B)$