

QUESTION 1

1.1 Convert the recurring decimal fraction $8.\overline{64}$ to a common fraction in its simplest form. (3)

1.2 Factorise the following expressions fully:

1.2.1 $21x^2 + 81xy + 54y^2$ (3)

1.2.2 $x^3 + 27$ (2)

1.2.3 $18x^2 + 3x - 8y^2 + 2y$ (4)

1.3 Simplify the following expressions fully:

1.3.1 $2x(x - 2)^2 - 2x(-3 + x^2)$ (4)

1.3.2 $\frac{x^2 + x - 6}{3x^2 - 12x} \div \frac{x^3 - 2x^2}{x^2 - 16} \times \frac{3}{x + 4}$ (5)

1.3.3 $\frac{49^x - 9}{7^x + 3}$ (3)

1.4 Solve for x :

1.4.1 $12x^2 - 4x - 21 = 0$ (2)

1.4.2 $\frac{x^2 + 3}{c^2} = b^2$ (3)

1.4.3 $\frac{-5x}{3} \geq x + 8$ (3)

1.4.4 Show that $\frac{5^{2024} - 5^{2023}}{5^{2022}} = 20$ (3)

1.5 Solve for x and y simultaneously in the following equations:

$x = 4 - 4y$ and $3x + 2y = 2$ (4)

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QUESTION 2

- 2.1 Consider the finite linear number pattern 17; 14; 11;; -103.

$$\begin{aligned} T_n &= -3n(17 - (-3)) \\ &= \frac{-3n + 20}{1} \\ T_4 &= -3(4) + 20 \\ &= 8 \end{aligned}$$

- 2.1.1 Write down the fourth term (T_4) of the pattern. (1)
- 2.1.2 Determine the general term (T_n) of the pattern. (2)
- 2.1.3 Calculate the number of terms in the pattern if -103 is the last term. (3)
- 2.1.4 Which term in the pattern will be the first term to have a negative value? Show all your working. (3)

- 2.2 Given:

- The common difference of a linear number pattern is -5.
- The nineteenth term (T_{19}) is -81.

Determine the general term (T_n) of the linear number pattern.

(3)
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QUESTION 3

- 3.1 A bluetooth speaker complete with radio is offered to Mr Broccardo for R3 900. He cannot afford the deal so agrees to a **hire purchase** agreement at 9,8% per annum and is required to make equal monthly repayments for **two** years. Determine Mr Broccardo's monthly instalments. (4)

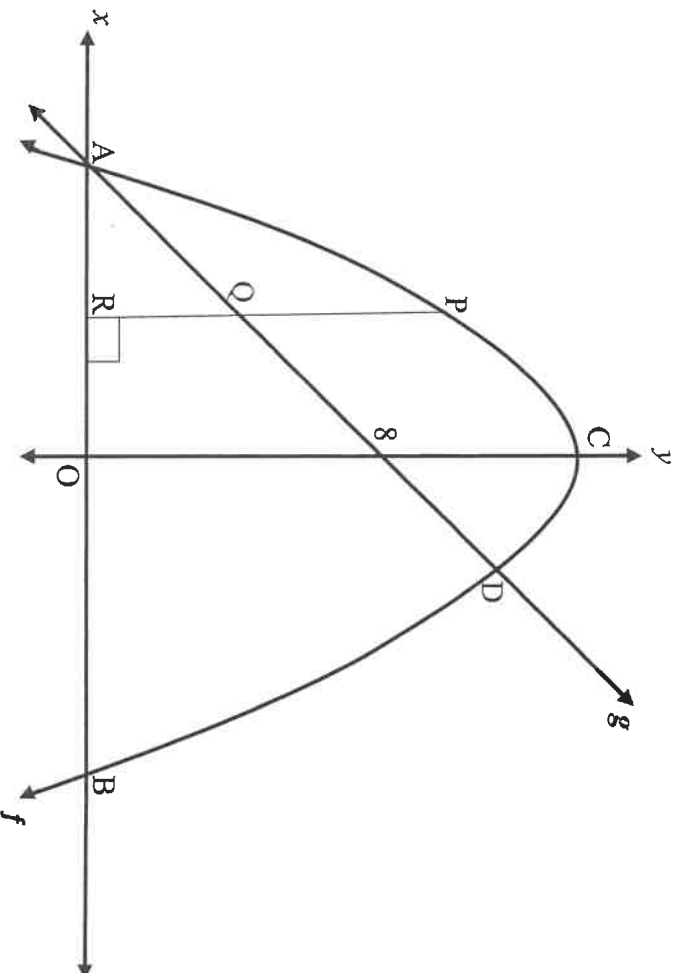
- 3.2 In the year 2000, a dozen eggs cost R5,00. The price of eggs in 2023 is R48,00 per dozen. Calculate the annual inflation rate for eggs over the past 23 years. (4)

- 3.3 Lara deposits R5 000 into a unit trust account that offers an interest rate of 10% p.a compounded annually in order to pay for an overseas holiday in 5 years time. After the second year, the interest rate decreases to 6,5% p.a. compounded annually. After four years, Lara runs into financial difficulty and withdraws R1 000. How much will she have available for her holiday? (4)
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QUESTION 4

- 4.1 Sketch the graphs of $p(x) = \frac{4}{x} + 1$ and $h(x) = -\frac{1}{3}x + 1$ on the annexure provided at the end of the question paper. Clearly show ALL asymptotes and intercepts with the axes. (5)

- 4.2 The graphs of $f(x) = -x^2 + 16$ and $g(x) = mx + 8$ are sketched in the diagram below. A and B are the $x -$ intercepts of f . C is the turning point of f .



- 4.2.1 Write down the length of OC. (1)
- 4.2.2 Determine the length of \underline{AB} . (3)
- 4.2.3 Determine the value of m . (1)
- 4.2.4 Show that the coordinates of D, a point of intersection of f and g , is D(2 ; 12). (5)
- 4.2.5 If OR = 1 unit, determine the length of PQ. (4)
- 4.2.6 For which values of x is $g(x) \leq f(x)$? (2)
- 4.3 Draw a rough sketch of $y = a \cdot b^x + q$ if $a > 0$, $0 < b < 1$ and $q < 0$. (3)

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QUESTION 5

5.1 Two events, A and B, are such that $P(A) = \frac{1}{2}$ and $P(B) = \frac{1}{3}$.

5.1.1 Calculate $P(A \text{ and } B)$ if $P(A \text{ or } B) = \frac{2}{3}$. (2)

5.1.2 Calculate $P(A \text{ or } B)$ if A and B are mutually exclusive. (2)

5.2 In a group of 50 teenagers,

- 10 can play the flute(F) and the piano(P).
- 3 can play only the piano.
- $x + 2$ can play the flute but not the piano.
- 25 can play neither the flute nor the piano.

5.2.1 Represent the information given above in a Venn diagram, showing the number of outcomes in each region. (4)

5.2.2 Determine the value of x . (2)

5.2.3 Calculate the probability that a teenager chosen from this group at random can play:
(a) only the flute. (1)
(b) at least one of the two instruments. (2)

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