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MATHEMATICS: EXAMINATION

GRADE 10 · TERM 3 · SEPTEMBER 2025

Functions · Trigonometry · Statistics

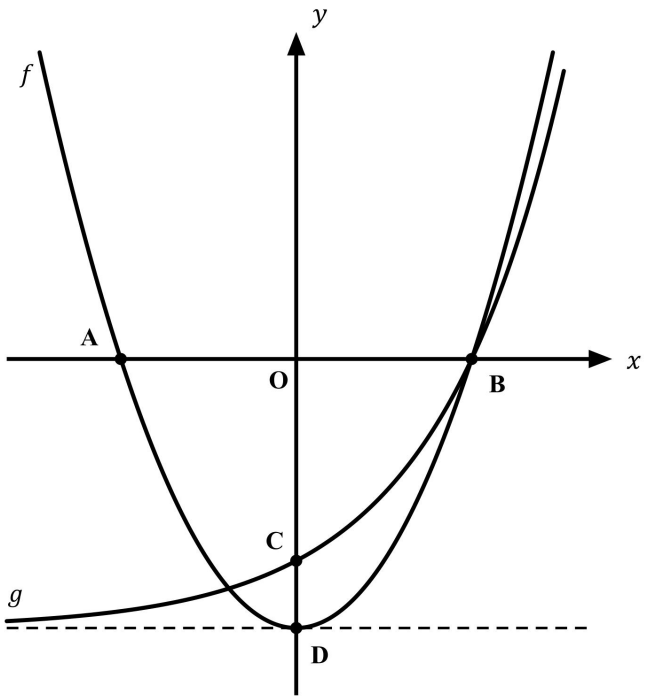
TOTAL: 50 MARKS **TIME: 1 HOUR**

INSTRUCTIONS AND INFORMATION

1. This question paper consists of FIVE questions.
2. Answer ALL the questions.
3. Show all calculations and steps clearly.
4. Calculators may be used, unless stated otherwise.
5. If necessary, round off to TWO decimal places, unless stated otherwise.
6. Number your answers correctly according to the numbering system used in this question paper.
7. It is in your own interest to write legibly and to present neat work.

QUESTION 1

The graphs of $f(x) = x^2 - 4$ and $g(x) = a^x + q$ are shown below. A and B are the x-intercepts of f. D, the y-intercept of f, lies on the horizontal asymptote of g. B and C are respectively the x- and y-intercepts of g.



1.1 Determine the coordinates of A and B. (3)

1.2 What is the domain of f? (1)

1.3 Write down the coordinates of D. (1)

1.4 For which value(s) of x is the graph of f increasing? (1)

1.5 Determine the equation of g. (3)

1.6 What is the range of g? (1)

1.7 Write down the length of OC. (1)

1.8 Determine the value(s) of x for which:

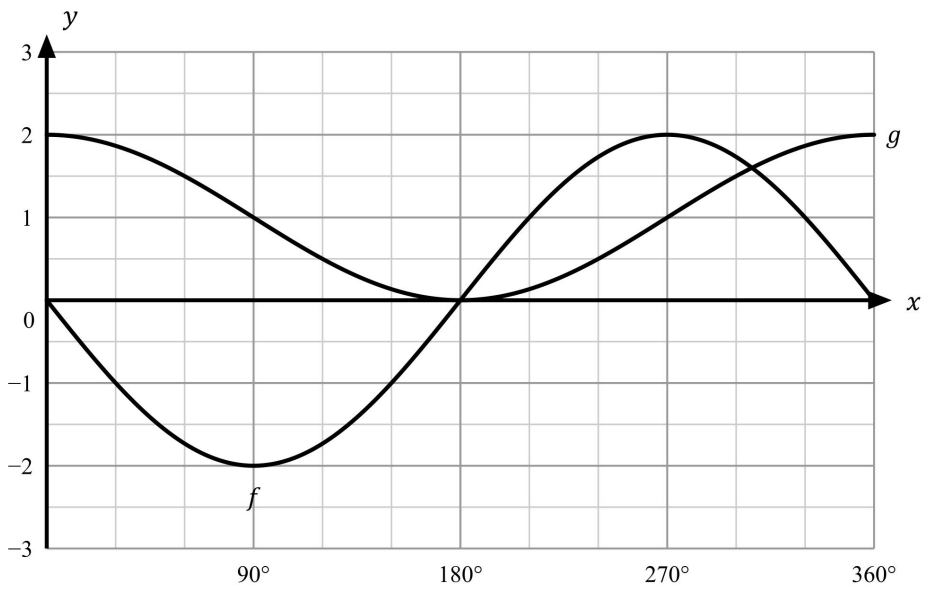
1.8.1 $g(x) < 0$ (1)

1.8.2 $f(x) \geq 0$ (1)

[13]

QUESTION 2

The graphs of $f(x) = p \sin x$ and $g(x) = \cos x + q$ for $x \in [0° ; 360°]$ are sketched below.



2.1 Determine the values of p and q. (2)

2.2 Write down the amplitude of g. (1)

2.3 Write down the range of f. (2)

2.4 For which values of x will $f(x) \geq 0$? (2)

2.5 The graph of g is reflected about the x-axis and then shifted 2 units upwards to obtain the graph of h. Write down the equation of h. (2)

[9]

QUESTION 3

John recorded the amount of data (in MB) that he used daily over the past 15 days:

3 ; 10 ; 12 ; 13 ; 15 ; 15 ; 16 ; 18 ; 24 ; 26 ; 34 ; 40 ; 42 ; 43 ; 45

3.1 Calculate the range of the data. (2)

3.2 Calculate the mean data usage. (2)

3.3 Write down the five-number summary of the data. (3)

3.4 Draw a box-and-whisker diagram to represent the data. (3)

3.5 Determine the interquartile range. (3)

[13]

QUESTION 4

The company HEALTHCRAZY conducted a survey at a gym in Cape Town to find out which age group exercised the most. The results are shown in the table below.

AGES	FREQUENCY
$20 \leq x < 30$	29
$30 \leq x < 40$	28
$40 \leq x < 50$	21
$50 \leq x < 60$	15
$60 \leq x < 70$	10
$70 \leq x < 80$	2

4.1 Identify the modal class of the data. (1)

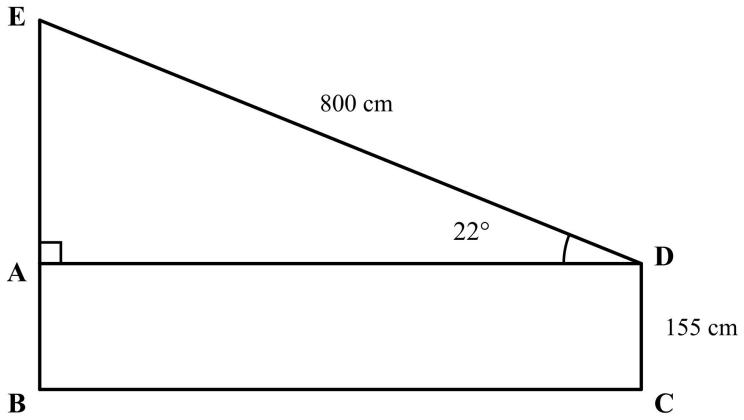
4.2 Determine in which interval the median lies. (1)

4.3 Estimate the mean age of the people in the survey. (4)

[6]

QUESTION 5

5.1 In the diagram below, ABCD is a rectangle and E lies on BA produced. DC = 155 cm and DE = 800 cm. The angle of elevation from D to E is 22°.



5.1.1 Calculate BE. (4)

5.2 Simplify fully, without the use of a calculator:

5.2.1 $\dfrac{\tan 45° \cdot \operatorname{cosec} 60°}{\cot 30° \cdot \cos^2 45°}$ (5)

[9]

TOTAL: 50