



education

DEPARTMENT: EDUCATION
MPUMALANGA PROVINCE

NATIONAL SENIOR CERTIFICATE EXAMINATION

MATHEMATICS

21 AUGUST 2026

GRADE 11

MARKS: 50

TIME: 60 Minutes

This test consists of 7 pages including the cover page and answer sheet.

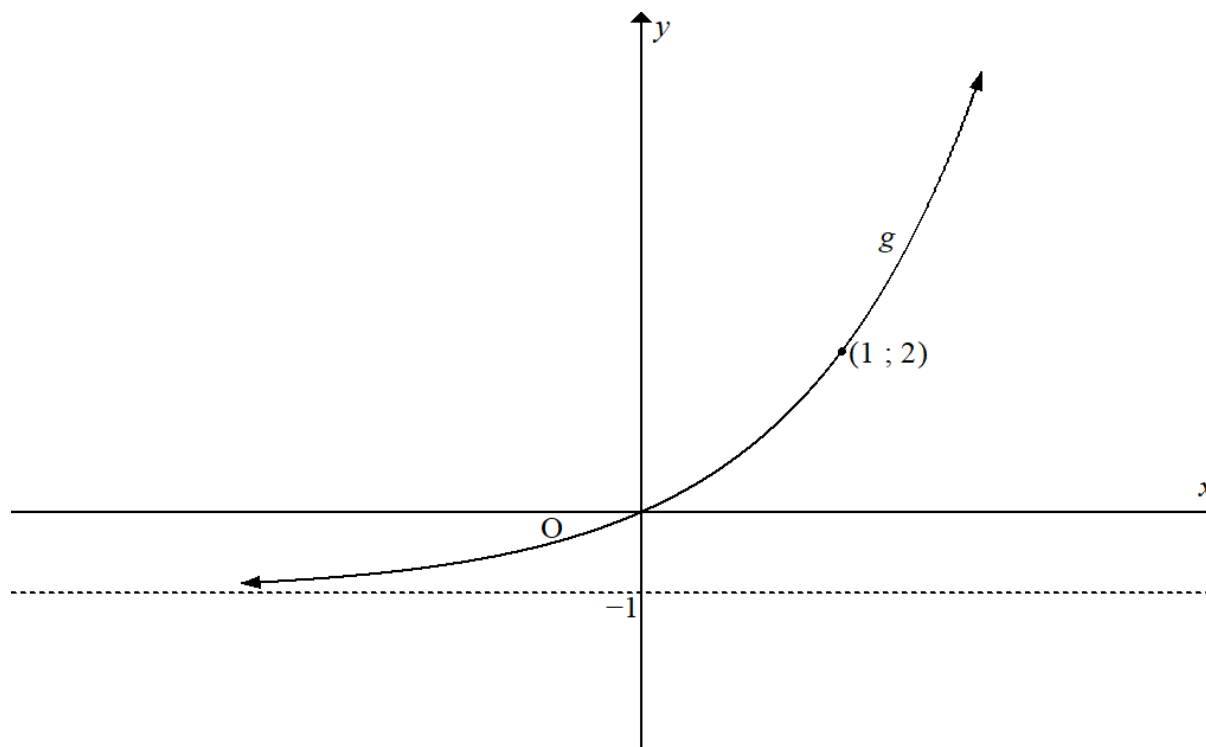
INSTRUCTIONS AND INFORMATION

Read the following instructions carefully before answering the questions.

- 1 This question paper consists of FIVE questions.
- 2 Answer ALL 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 off answers to TWO decimal places, unless stated otherwise.
- 8 Diagrams are not necessarily drawn to scale
- 9 Write neatly and legibly.

QUESTION 1

The graph of $g(x) = b^x + q$ is drawn below. T(1; 2) is a on the graph.



- 1.1 Determine the equation of g . (3)
- 1.2 Write down the equation of the asymptote of g . (1)
- 1.3 Write down the equation of f if f is the graph of g shifted 2 units to the right (1)
- 1.4 Calculate the average gradient of g between point T and the origin. (2)
- 1.5 If the domain of $g(x)$ is restricted to be $x \in [-2; 3]$, write down the range of g . (3)

[10]

QUESTION 2

The lines $y = -x + 4$ and $y = x - 2$ are the axes of symmetry of the function

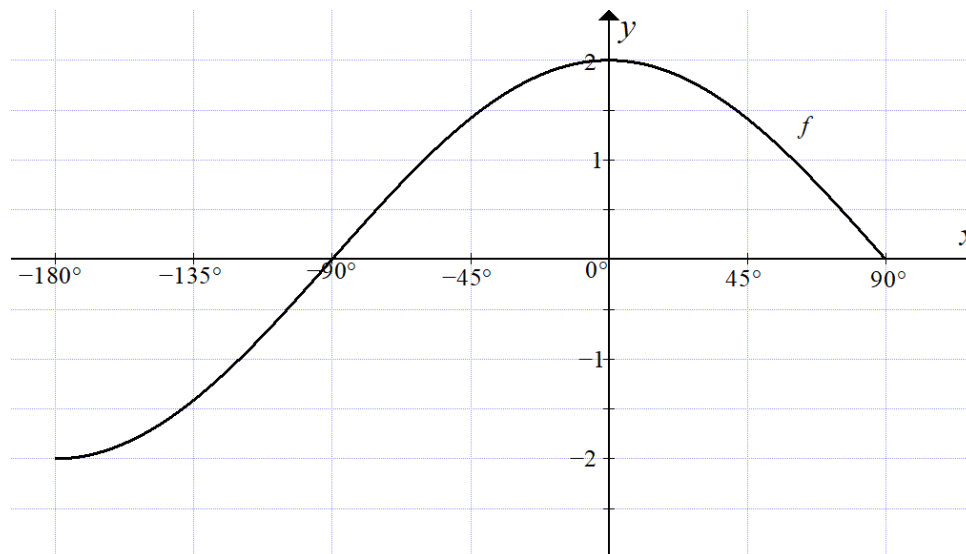
$$f(x) = \frac{-3}{x+p} + q.$$

- 2.1 Show that $p = -3$ and $q = 1$ (4)
- 2.2 Calculate the x -intercepts of f . (2)
- 2.3 Calculate the y -intercepts of f . (2)
- 2.4 Sketch the graph of f in your ANSWER BOOK. Clearly label all intercepts with the axes and the asymptotes. (3)
- 2.5 For which values of x will $x \cdot f(x) \leq 0$? (3)

[14]**QUESTION 3**

Below is the graphs of:

$$f(x) = a \cos x \text{ for } x \in [-180^\circ; 90^\circ].$$

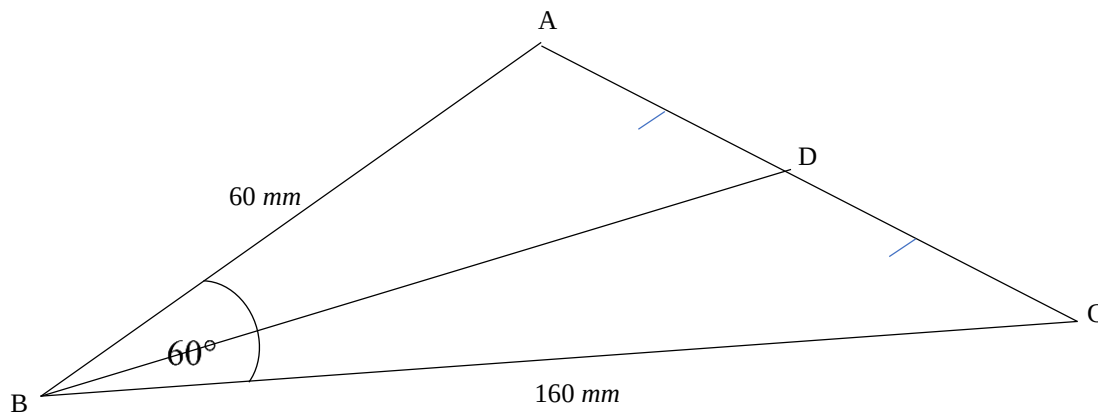


- 3.1 Write down the value of a . (1)
- 3.2 Write down the period of $g(x) = -\cos 2x$ (1)
- 3.3 Sketch the graph of $g(x) = -\cos 2x$ for $x \in [-180^\circ; 90^\circ]$ on the set of axis provided in the answer sheet. (3)

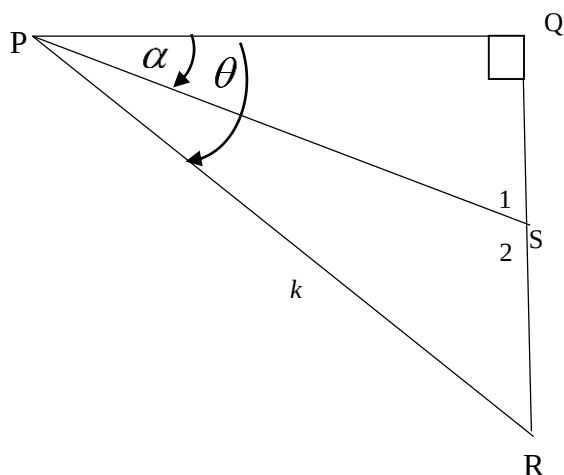
[5]

QUESTION 4

- 4.1 In the figure below, $\triangle ABC$ is drawn with D on AC such that $AD = DC$. The line BD is drawn. $BC = 160 \text{ mm}$, $AB = 60 \text{ mm}$ and $\hat{A}BC = 60^\circ$.



- 4.1.1 Calculate the length of AC . (3)
- 4.1.2 Without the use of a calculator determine $\sin \hat{A}$. (4)
- 4.1.3 Hence, prove that the area of $\triangle ABD = 1200\sqrt{3} \text{ mm}^2$. (2)
- 4.2 In the diagram below, $PQ \perp QR$, $\hat{Q}PS = \alpha$ and $\hat{Q}PR = \theta$ and $PR = k$.

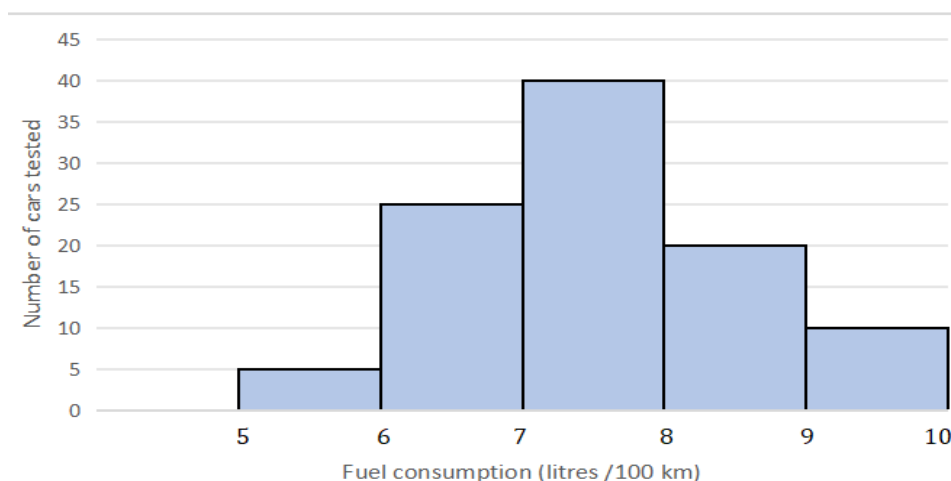


- 4.2.1 Write down the size of $\hat{R}PS$ in terms of α and θ . (1)
- 4.2.2 Show that $RS = \frac{k \cdot \sin(\theta - \alpha)}{\cos \alpha}$ (3)
- 4.2.3 Calculate the length of RS if $k = 17$ units, $\theta = 58^\circ$ and $\alpha = 28^\circ$. (2)

[15]**QUESTION 5**

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- 5.1 The fuel consumption of a car is expressed as the number of liters per 100 kilometers (l/100 km) which the car use. The histogram below indicates the results of tests done on a different models of a specific car.



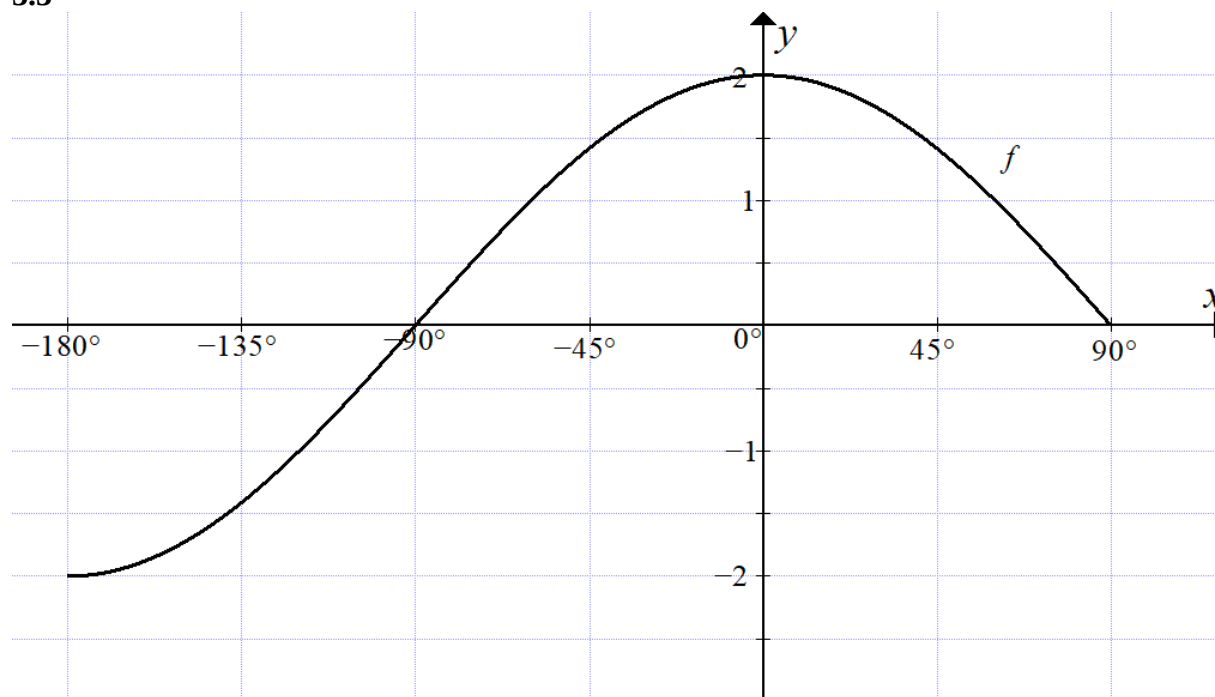
- 5.1.1 How many cars were used? (1)
- 5.1.2 Write down the modal class. (1)
- 5.2 Learners collected cans during “Operation Clean Up”. The number of cans collected by 10 classes is shown below.

250	259	265	276	290	290	294	310	315	330
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- 5.2.1 Calculate the mean number of cans collected by these 10 classes. (2)
- 5.2.2 Draw a box and whisker diagram of the data on the scaled line provided on the answer sheet. (2)

[6]

TOTAL MARKS: 50

ANSWER SHEET**NAME:** _____**3.3****5.2.2**