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MATHEMATICS: EXAMINATION

GRADE 10 · TERM 3 · SEPTEMBER 2025

Functions · Trigonometry · Statistics

TOTAL: 50 MARKS TIME: 1 HOUR

MEMORANDUM / MARKING GUIDELINE

One ✓ = one mark. Accept any other mathematically correct method.

QUESTION 1

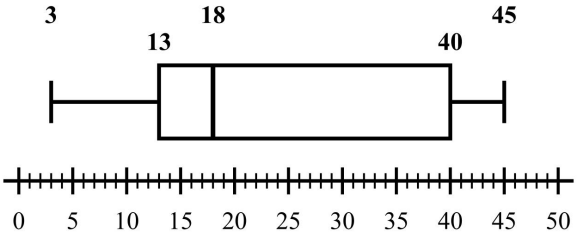
1.1	$x^2 - 4 = 0$ ✓ $(x - 2)(x + 2) = 0$ A(−2 ; 0) ✓ B(2 ; 0) ✓	✓ $f(x) = 0$ ✓ A(−2 ; 0) ✓ B(2 ; 0)	(3)
1.2	$x \in \mathbb{R}$ ✓	✓ answer	(1)
1.3	D(0 ; −4) ✓	✓ answer	(1)
1.4	$x > 0$ ✓	✓ answer	(1)
1.5	$q = -4$ ✓ (the asymptote of g is $y = -4$) $0 = a^2 - 4$ ✓ (B(2 ; 0) lies on g) $a^2 = 4$, so $a = 2$ $(a > 0)$ $g(x) = 2^x - 4$ ✓	✓ $q = -4$ ✓ substituting B(2 ; 0) ✓ equation of g	(3)
1.6	$y > -4$ ✓	✓ answer	(1)
1.7	$g(0) = 2^0 - 4 = -3$, so C(0 ; −3) OC = 3 units ✓	✓ answer	(1)
1.8.1	$x < 2$ ✓	✓ answer	(1)
1.8.2	$x \leq -2$ or $x \geq 2$ ✓	✓ answer	(1)
		TOTAL	**[13]**

QUESTION 2

2.1	$p = -2$ ✓ $q = 1$ ✓	✓ $p = -2$ ✓ $q = 1$	(2)
2.2	Amplitude = 1 ✓	✓ answer	(1)
2.3	$-2 \leq y \leq 2$ ✓✓ [or $y \in [-2 ; 2]$]	✓✓ −2 and 2 with the correct signs	(2)
2.4	$180° \leq x \leq 360°$ ✓✓ [Accept also $x = 0°$, where $f(x) = 0$]	✓✓ 180° and 360° with the correct signs	(2)

2.5	Reflected about the x-axis: $y = -\cos x - 1$ ✓ $h(x) = -\cos x - 1 + 2 = -\cos x + 1$ ✓	✓ $-\cos x - 1$ ✓ $h(x) = -\cos x + 1$	(2)
		TOTAL	**[9]**

QUESTION 3

3.1	Range = 45 − 3 ✓ = 42 MB ✓	✓ 45 − 3 ✓ answer	(2)
3.2	Mean = $\frac{356}{15}$ ✓ = 23,73 MB ✓	✓ sum of the data over 15 ✓ answer	(2)
3.3	Minimum = 3 and maximum = 45 ✓ Median = 18 (the 8th value) ✓ $Q_1 = 13$ and $Q_3 = 40$ ✓	✓ minimum and maximum ✓ median ✓ Q_1 and Q_3	(3)
3.4	 Whiskers from 3 to 45 ✓ Box from 13 to 40 ✓ Median line at 18 ✓	✓ whiskers to 3 and 45 ✓ box from 13 to 40 ✓ median at 18	(3)
3.5	IQR = $Q_3 - Q_1$ ✓ = 40 − 13 ✓ = 27 MB ✓	✓ $Q_3 - Q_1$ ✓ substitution ✓ answer	(3)
		TOTAL	**[13]**

QUESTION 4

4.1	$20 \leq x < 30$ ✓	✓ modal class	(1)
4.2	$n = 105$, so the median is the 53rd age; 29 + 28 = 57 $30 \leq x < 40$ ✓	✓ answer	(1)
4.3	Midpoints: 25 ; 35 ; 45 ; 55 ; 65 ; 75 ✓ 29(25) + 28(35) + 21(45) + 15(55) + 10(65) + 2(75) = 4 275 ✓ Estimated mean = $\frac{4\,275}{105}$ ✓ = 40,71 years ✓	✓ midpoints ✓ sum of frequency × midpoint ✓ dividing by 105 ✓ answer	(4)
		TOTAL	**[6]**

QUESTION 5

5.1.1	$\sin 22° = \frac{AE}{800}$ ✓ AE = 800 sin 22° = 299,69 cm ✓ AB = DC = 155 cm (opposite sides of a rectangle) ✓ BE = 299,69 + 155 = 454,69 cm ✓	✓ sine ratio ✓ AE = 299,69 cm ✓ AB = 155 cm ✓ answer	(4)
5.2.1	tan 45° = 1 ✓ $\text{cosec } 60° = \frac{2}{\sqrt{3}}$ ✓ cot 30° = $\sqrt{3}$ ✓ $\cos^2 45° = \frac{1}{2}$ ✓ Numerator = $1 \times \frac{2}{\sqrt{3}} = \frac{2}{\sqrt{3}}$ Denominator = $\sqrt{3} \times \frac{1}{2} = \frac{\sqrt{3}}{2}$ Expression = $\frac{2}{\sqrt{3}} \times \frac{2}{\sqrt{3}} = \frac{4}{3}$ ✓	✓ value of tan 45° ✓ value of cosec 60° ✓ value of cot 30° ✓ value of $\cos^2 45°$ ✓ answer	(5)
		TOTAL	**[9]**

TOTAL: 50