Oxford Revise | AQA GCSE Maths Higher | Answers

Chapter 13 Cubic graphs, reciprocal graphs, exponential graphs, transformation of graphs

Question	Answer	Extra information	Marks
13.1	When $x = 1, y = 2$ $2 = \frac{a}{1}$ $a = 2$		1 1 1
13.2	$y = ab^x$ $10 = ab^1$ $0.4 = ab^{-1}$ Divide to eliminate a: $\frac{10}{0.4} = \frac{b}{b^{-1}}$ $25 = b^2$ $b = 5$ Use one point and b = 5 to find a: $10 = a \times 5^1$ $a = 2$	Set up equations and eliminate a Solve for b Solve for a	1 1 1
13.3	A = Reciprocal B = Cubic C = Exponential	1 mark for two correct 2 marks for all correct	1 1

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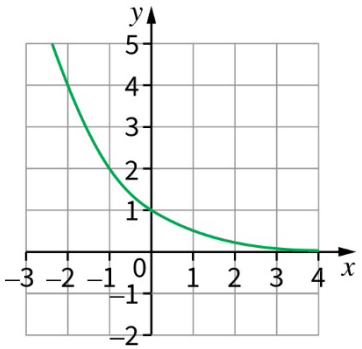
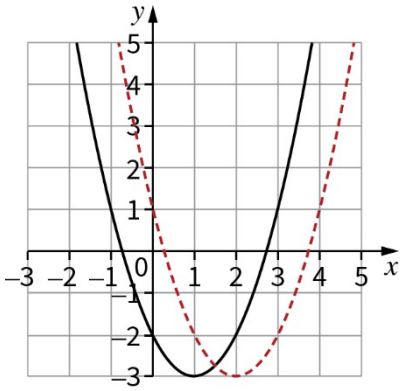
Question	Answer	Extra information	Marks
13.4	Exponential curve sketched passing through $(0, 1)$ Correctly shown to approach but never equal 0 as $x \to -\infty$	1 mark for point at $(0, 1)$, labelled as such 1 mark for $y = 0$ asymptote 1 mark for correct shape as x gets large	1 1 1
13.5	$(5, 10)$	1 mark for x or y correct, as long as work shows how it was calculated	1 1
13.6	Quadratic curve sketched that clearly shows the graph of f(x) being reflected in the x-axis. Turning point is now a maximum point at $x = -4$		2
13.7	$y = -f(x)$		1
13.8		General shape correct Passing through $(0, 1)$ Approaching, but not definitely *not* touching, the x-axis as x increases	1 1 1

Question	Answer	Extra information	Marks
13.9 (a)	$y = x^2 - 4x + 1$ Complete the square: $y = (x-2)^2 - 4 + 1$ $= (x-2)^2 - 3$ Minimum point on the curve occurs when $x = 2$, which is at $(2, -3)$	Attempting to complete the square Correct answer	1 1
13.9 (b)	The graph is a translation of the function by 1 unit to the left.  Minimum point co-ordinates $(1, -3)$	Correct translation of 1 unit to the left	1

Question	Answer	Extra information	Marks
13.10	$5x + y = 10$ $10xy = -48$ Rearrange second equation: $y = \frac{-48}{10x}$ Substitute this in the first equation and rearrange to form a quadratic: $5x + \frac{-48}{10x} = 10$ $50x^2 - 48 = 100x$ $50x^2 - 100x - 48 = 0$ $25x^2 - 50x - 24 = 0$ Use the quadratic formula or otherwise solve for x: $x = -0.4$ or $x = 2.4$ $y = 12$ or $y = -2$ Solutions are $(-0.4, 12)$ and $(2.4, -2)$	Attempt to rearrange one of the equations Substitute to eliminate one variable Solve the quadratic Find x or y values Find the two coordinates	1 1 1 1 1
13.11	The difference between 4 and 25 is $25 - 4 = 21$ There are three "jumps" between 4 and 25, so each jump is $\frac{21}{3} = 7$ Thus, the sequence starts: $4, 11, 18, 25$ Continuing the sequence with the common difference of 7 gives $32, 39, 46, 53, 60, 67$ 61 is not a term in this sequence	Using the 1st and 4th terms to extract the common difference. Use the common difference to fill in the sequence Continuing the sequence beyond 61 Correct answer, demonstrated	1 1 1 1