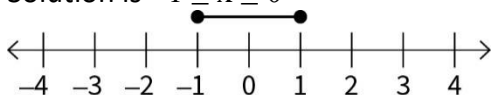
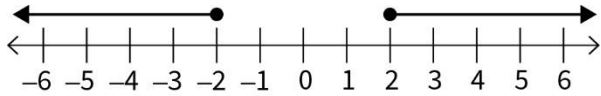


# Oxford Revise | Edexcel GCSE Maths Higher | Answers

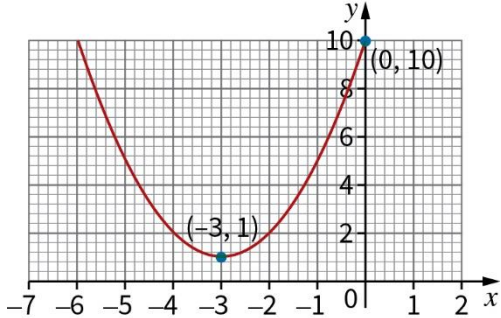
## Chapter 10 Quadratic graphs, iterations, solving quadratic inequalities

Question	Answer	Extra information	Marks
10.1 (a)	$x^2 - 4 \leq -3$ $x^2 - 1 \leq 0$ Solution is $-1 \leq x \leq 1$ 	Finding $-1$ and $1$ Correct solution Correct number line representation	1 1 1
10.1 (b)	$7x^2 \geq 28$ $x^2 \geq 4$ $x^2 - 4 \geq 0$ Solution is $x \leq -2$ or $x \geq 2$ 	Finding $-2$ and $2$ Correct solution (using “or”, not “and”) Correct number line representation	1 1 1
10.2 (a)	$x^2 - 8x + 15 \leq 0$ $(x - 5)(x - 3) \leq 0$ Roots are $3$ and $5$ The quadratic is U shaped, so the solution is the set of numbers between $3$ and $5$ , inclusive. In set notation, $\{x : 3 \leq x \leq 5\}$	Factorising or attempting to solve the quadratic Finding $3$ and $5$ Correct solution shown on a graph Correct solution in set notation	1 1 1 1

Question	Answer	Extra information	Marks
10.2 (b)	$3x^2 - x - 4 > 0$ $(3x - 4)(x + 1) < 0$ Roots are $\frac{4}{3}$ and $-1$ The quadratic is U shaped, so the solution is the set of numbers less than $-1$ and greater than $\frac{4}{3}$ exclusive. In set notation, $\{x : x < -1\} \cup \left\{x : x > \frac{4}{3}\right\}$	Factorising or attempting to solve the quadratic Finding $\frac{4}{3}$ and $-1$ Correct solution shown on a graph Correct solution in set notation	1 1 1 1
10.2 (c)	$x^2 - 30 < -7x$ $x^2 + 7x - 30 < 0$ $(x + 10)(x - 3) < 0$ Roots are 3 and $-10$ The quadratic is U shaped, so the solution is the set of numbers between $-10$ and 3, exclusive. In set notation, $\{x : -10 < x < 3\}$	Factorising or attempting to solve the quadratic Finding 3 and $-10$ Correct solution shown on a graph Correct solution in set notation	1 1 1 1
10.3	$2n + 7 \geq 3$ $2n \geq -4$ $n \geq -2$ $\frac{12 - n}{n^2} > 1$ $12 - n > n^2$ $n^2 + n - 12 < 0$ $(n + 4)(n - 3) < 0$ $-4 < n < 3$ $-2 \leq n < 3$ Both are satisfied when $-2 \leq n < 3$	Correct method to solve $2n + 7 \geq 3$ Rearrange $\frac{12 - n}{n^2} > 1$ to a suitable inequality Method to solve quadratic inequality $-4 < n < 3$ $-2 \leq n < 3$	1 1 1 1 1

Question	Answer	Extra information	Marks
10.4	$14 < \frac{w^2 - 7}{3} < 31$ $42 < w^2 - 7 < 93$ $49 < w^2 < 100$ $w^2 < 100 \Rightarrow -10 < w < 10$ $w^2 > 49 \Rightarrow n < -7, n > 7$ Both are satisfied when $-10 < n < -7$ and also when $7 < n < 10$	Correct method to rearrange for $w^2$ $49 < w^2 < 100$ $-10$ and $10$ , or $-7$ and $7$ $-10 < n < -7$ or $7 < n < 10$ Both inequality statements	1 1 1 1 1
10.5 (a)	When $x = 2, x^4 - 12x = -8$ When $x = 3, x^4 - 12x = 45$ As there is a change of sign, there is a root (solution) between 2 and 3	Substituting in 2 and 3 Correct conclusion	1 1
10.5 (b)	$x_0 = 2$ $x_1 = \sqrt[4]{12 \times 2} = 2.213\dots$ $x_2 = 2.270\dots$ $x_3 = 2.284\dots$ $x_4 = 2.288\dots$ $x_5 = 2.289\dots$ $x_6 = 2.289\dots$ The solution is 2.289, accurate to 3 dp	$x_1$ At least six iterations Correct answer with reason	1 1 1
10.6 (a)	The roots are where the curve crosses the $x$ -axis, so they can be found where $y = 0$	Correct explanation	1

Question	Answer	Extra information	Marks
10.6 (b)	$x^3 + 5x^2 - 1 = 0$ $x^3 = 1 - 5x^2$ $x = \frac{1 - 5x^2}{x^2}$	Making $x^3$ the subject Correct answer	1 1
10.6 (c)	$x_0 = -4$ $x_1 = -4.937\dots$ $x_2 = -4.958\dots$ $x_3 = -4.959$ The solution is $-4.96$ , to 2 dp	$x_1$ At least two further iterations Correct answer	1 1 1
10.6 (d)	$x^3 + 5x^2 - 1 = 0$ $5x^2 = 1 - x^3$ $x = \sqrt{\frac{1 - x^3}{5}}$	Making $x^2$ the subject Correct answer	1 1
10.6 (e)	$x_0 = 0$ $x_1 = 0.447\dots$ $x_2 = 0.426\dots$ $x_3 = 0.429\dots$ $x_4 = 0.429\dots$ The solution is $0.43$ , accurate to 2 dp	$x_1$ At least three further iterations Correct answer	1 1 1

Question	Answer	Extra information	Marks
10.6 (f)	$x_0 = -1$ $x_1 = -0.4$ $x_2 = -0.532\dots$ $x_3 = -0.432\dots$ $x_4 = -0.499\dots$ $x_5 = -0.450\dots$ $x_6 = -0.484\dots$ $x_7 = -0.459\dots$ The solution is $-0.5$ , accurate to 1 dp	$x_1$ At least five further iterations Correct answer	1 1 1
10.7 (a)	$x^2 + 6x + 10 = (x + 3)^2 + 1$ $a = 3, b = 1$	$a = 3$ $b = 1$	1 1
10.7 (b)	$(-3, 1)$		1
10.7 (c)		Shape correct with either y-intercept or turning point labelled. Shape correct with both y-intercept and turning point labelled.	1 1

Question	Answer	Extra information	Marks
10.8	$(x-1)(2-x)(x+4)$ $= (3x-2-x^2)(x+4)$ $= -x^3 - x^2 + 10x - 8$	Correct expansion of any two sets of brackets Attempt to multiply by the remaining set of brackets All terms correct, but unsimplified Fully correct and simplified	1 1 1 1
10.9	$x^2 + 25 = 6x$ $x^2 - 6x + 25 = 0$ $x^2 - 6x + 9 - 9 + 25 = 0$ $(x-3)(x-3) + 16 = 0$ $(x-3)^2 + 16 = 0$	Rearrange to $x^2 - 6x + 25 = 0$ Attempt to create $(x-3)^2$ Fully correct answer	1 1 1