

Level 3 Algebra - Completing The Square- Answers

Jan 2015 - Question 11

11	(a)	$(x+2)^2 - 4 + 7$	$(x+2)^2 + 3$	2	M1 for $(x+2)^2$ oe A1 for $(x+2)^2 + 3$
	(b)		$(-2, 3)$	1	B1 for $(-2, 3)$ or ft from (a)

Jan 2016 - Question 11

11	(a)		$(x-5)^2 + 4$	2	B1 $p = -5$ oe B1 $q = 4$ oe
	(b)		Graph sketch	3	M1 for a parabola with the correct orientation. M1 "(5, 4)" labelled at minimum point or 29 labelled as y intercept of their parabola A1 fully correct graph drawn with all labels

June 2018 - Question 19

Question	Working	Answer	Mark	Notes
19 (a)		$9 - (x+2)^2$	2	M1 for $(x+2)^2$ or $b=2$ A1 for $9 - (x+2)^2$ (accept $a=9, b=2$)
(b)		$(-2, 9)$	1	B1 ft from answer in correct form in (a)
(c)		B	1	B1 cao

Jan 2019 - Question 17

Question	Working	Answer	Mark	Notes
17 (a)		$(2x-7)^2 - 49$	2	B1 $a=7$ B1 $b=49$
(b)		$(3.5, -49)$	1	B1 ft completed square in (a)

June 2019 - Question 11

11	(a)(i)		$-\frac{6}{5}$	1	B1 oe
	(ii)		$-\frac{8}{5}$	1	B1 oe
	(b)		$(x-4)^2 - 9$	2	M1 for $(x-4)^2$ A1 for $(x-4)^2 - 9$

Jan 2020 - Question 10

Question	Working	Answer	Mark	Notes
10 (a)(i)		$6x^2 - 4x - 3 = 0$	1	B1 for correct equation with integer coefficients
(ii)	$\frac{- - 4 \pm \sqrt{(-4)^2 - 4 \times 6 \times -3}}{2 \times 6}$	$\frac{2 \pm \sqrt{22}}{6}$	3	M1 for stating the quadratic formula or correct substitution into formula fit from (a)(i) A1 fit for $\frac{4 \pm \sqrt{88}}{12}$ A1 for $\frac{2 \pm \sqrt{22}}{6}$
(b)		-3, -2	3	M1 for $(x+3)[(x+3)-1] = 0$ M1 for $(x+3)(x+2) = 0$ A1 for -3, -2 OR M1 for $x^2 + 6x + 9 - x - 3 = 0$ M1 for $(x+3)(x+2) = 0$ or use of the quadratic formula as far as $\frac{-5 \pm \sqrt{1}}{2}$ A1 for -3, -2
(c)		$(x-4)^2 - 13$	2	M1 $(x-4)^2$ oe A1 $(x-4)^2 - 13$

June 2022 - Question 10

10 (a)		3, 4	2	B2 for 3 and 4 or for $(x+3)^2 + 4$ (B1 for 3 or 4, may be seen in the working, eg $(x+3)^2 + 22$)
(b)		(-3, 4)	1	B1 fit (a)

Jan 2023 - Question 13

Question	Working	Answer	Mark	Notes
13 (a)		$\frac{2 \pm \sqrt{10}}{3}$	3	M1 for stating the quadratic formula or correct substitution into formula A1 for $\frac{4 \pm \sqrt{40}}{6}$ or $\frac{4 \pm 2\sqrt{10}}{6}$ A1 cao
(b)(i)		$(2x-3)^2 + 1$	3	M1 for a correct first step eg $(2x-a)^2$ or $4(x^2-3x) + 10$ OR $4(x^2-3x + \frac{10}{4})$ M1 for $(2x-3)^2$ or $4(x-\frac{3}{2})^2 + 1$ or fully correct equivalent expression eg $4[(x-\frac{3}{2})^2 + \frac{1}{4}]$ A1 for $(2x-3)^2 + 1$

Jan 2024 - Question 10

10 (a)		4, -5	2	M1 for $(x+4)^2 + c$ or one correct value A1 for 4 and -5
(b)		(-4, -5)	1	B1 fit (a)