

GCSE Maths: Rearranging first, and harder quadratics (Higher): answers

GCSE Maths - Quadratic and Simultaneous Equations - Higher - Lesson 14.3

Answers. Final answers to the worksheet questions. Full step-by-step solutions for every question are free at websink.site/gcse/maths/ch14-quadratics-simultaneous/higher/rearranging-first-and-harder-quadratics/

Exercise 14C Rearranging first, and harder quadratics Non-calculator

1 Solve by rearranging and factorising.

(a) $x^2 + 2x = 15$

Answer: $x = -5$ or $x = 3$

(b) $x^2 + 5x = 14$

Answer: $x = -7$ or $x = 2$

(c) $x^2 - x = 12$

Answer: $x = -3$ or $x = 4$

(d) $x^2 = 3x + 10$

Answer: $x = -2$ or $x = 5$

(e) $x^2 = 7x - 12$

Answer: $x = 3$ or $x = 4$

(f) $x^2 + 6x = -8$

Answer: $x = -4$ or $x = -2$

2 Solve. The letters appear on both sides.

(a) $x^2 + 3x = 2x + 6$

Answer: $x = -3$ or $x = 2$

(b) $x^2 - 5 = 4x$

Answer: $x = -1$ or $x = 5$

(c) $x^2 + 8 = 6x$

Answer: $x = 2$ or $x = 4$

(d) $x^2 - 2x = 3x - 6$

Answer: $x = 2$ or $x = 3$

(e) $x^2 + 4x = 2x + 3$

Answer: $x = -3$ or $x = 1$

(f) $x^2 - 3 = 2x$

Answer: $x = -1$ or $x = 3$

3 Expand the brackets, then solve.

(a) $x(x + 3) = 10$

Answer: $x = -5$ or $x = 2$

(b) $x(x - 2) = 24$

Answer: $x = -4$ or $x = 6$

(c) $(x + 1)(x + 2) = 6$

Answer: $x = -4$ or $x = 1$

(d) $(x - 1)(x + 4) = 6$

Answer: $x = -5$ or $x = 2$

(e) $(x + 3)(x + 4) = 30$

Answer: $x = -9$ or $x = 2$

(f) $(x - 2)(x + 1) = 4$

Answer: $x = -2$ or $x = 3$

4 Ali solves $(x + 1)(x + 3) = 15$ like this: " $x + 1 = 15$, so $x = 14$; or $x + 3 = 15$, so $x = 12$." Explain why this method is wrong and then solve the equation correctly.

Answer: $x = -6$ or $x = 2$

5 Show that $x(x + 5) = 14$ can be written as $x^2 + 5x - 14 = 0$, and then solve it.

Answer: $x = -7$ or $x = 2$

6 Amir solves $x^2 = 9x$ by dividing both sides by x , and gets " $x = 9$ ". Find all the solutions of the equation and say what Amir missed.

Answer: $x = 0$ or $x = 9$ (Amir missed $x = 0$)

7 A number squared, plus six times the number, makes 7. Find the number. (There are two possible answers.)

Answer: $x = -7$ or $x = 1$

8 Solve.

(a) $2x^2 + 5x = 3$

Answer: $x = -3$ or $x = \frac{1}{2}$

(b) $3x^2 - 7x = -2$

Answer: $x = \frac{1}{3}$ or $x = 2$

(c) $6x^2 + x = 2$

Answer: $x = -\frac{2}{3}$ or $x = \frac{1}{2}$

(d) $5x^2 + 7x = -2$

Answer: $x = -1$ or $x = -\frac{2}{5}$

(e) $4x^2 - 9x = -2$

Answer: $x = \frac{1}{4}$ or $x = 2$

(f) $2x^2 - x = 10$

Answer: $x = -2$ or $x = \frac{5}{2}$

9 Solve.

(a) $2x^2 + x = 15$

Answer: $x = -3$ or $x = \frac{5}{2}$

(b) $3x^2 = 5x + 2$

Answer: $x = -\frac{1}{3}$ or $x = 2$

(c) $6x^2 = 7x + 3$

Answer: $x = -\frac{1}{3}$ or $x = \frac{3}{2}$

(d) $2x^2 + 3x = 2x + 3$

Answer: $x = -\frac{3}{2}$ or $x = 1$

(e) $(2x - 1)(x + 3) = 4$

Answer: $x = -\frac{7}{2}$ or $x = 1$

(f) $x(2x + 5) = 3$

Answer: $x = -3$ or $x = \frac{1}{2}$

10 Sam solves $(x + 2)(x + 3) = (x + 2)(2x - 1)$ by dividing both sides by $(x + 2)$. He finds only $x = 4$. Solve the equation properly and explain what Sam missed.

Answer: $x = -2$ or $x = 4$ (Sam lost $x = -2$ by dividing by $(x + 2)$, which is 0 when $x = -2$)