

GCSE Maths: Solving quadratic equations by factorising (Higher): answers

GCSE Maths - Quadratic and Simultaneous Equations - Higher - Lesson 14.2

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/solving-quadratic-equations-by-factorising/

Exercise 14B Solving quadratic equations by factorising Non-calculator

1 Solve. These equations are already factorised.

(a) $(x + 2)(x + 5) = 0$

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

(b) $(x - 3)(x + 7) = 0$

Answer: $x = -7$ or $x = 3$

(c) $(x - 4)(x - 1) = 0$

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

(d) $x(x + 6) = 0$

Answer: $x = -6$ or $x = 0$

(e) $(x + 8)(x - 8) = 0$

Answer: $x = -8$ or $x = 8$

(f) $(x - 5)^2 = 0$

Answer: $x = 5$

2 Solve by factorising.

(a) $x^2 + 6x + 5 = 0$

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

(b) $x^2 + 7x + 12 = 0$

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

(c) $x^2 + 8x + 15 = 0$

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

(d) $x^2 + 9x + 14 = 0$

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

(e) $x^2 + 11x + 10 = 0$

Answer: $x = -10$ or $x = -1$

(f) $x^2 + 10x + 21 = 0$

Answer: $x = -7$ or $x = -3$

3 Solve by factorising.

(a) $x^2 - 7x + 10 = 0$

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

(b) $x^2 - 6x + 8 = 0$

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

(c) $x^2 - 8x + 12 = 0$

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

(d) $x^2 - 9x + 18 = 0$

Answer: $x = 3$ or $x = 6$

(e) $x^2 - 10x + 16 = 0$

Answer: $x = 2$ or $x = 8$

(f) $x^2 - 11x + 24 = 0$

Answer: $x = 3$ or $x = 8$

4 Solve by factorising.

(a) $x^2 + 2x - 8 = 0$

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

(b) $x^2 - x - 6 = 0$

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

(c) $x^2 + 3x - 10 = 0$

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

(d) $x^2 - 4x - 12 = 0$

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

(e) $x^2 + x - 20 = 0$

Answer: $x = -5$ or $x = 4$

(f) $x^2 - 2x - 24 = 0$

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

5 Solve. Take out the common factor first.

(a) $x^2 + 3x = 0$

Answer: $x = -3$ or $x = 0$

(b) $x^2 - 7x = 0$

Answer: $x = 0$ or $x = 7$

(c) $x^2 + 10x = 0$

Answer: $x = -10$ or $x = 0$

(d) $2x^2 - 8x = 0$

Answer: $x = 0$ or $x = 4$

(e) $3x^2 + 9x = 0$

Answer: $x = -3$ or $x = 0$

(f) $x^2 - x = 0$

Answer: $x = 0$ or $x = 1$

6 Solve these differences of two squares.

(a) $x^2 - 4 = 0$

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

(b) $x^2 - 25 = 0$

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

(c) $x^2 - 64 = 0$

Answer: $x = -8$ or $x = 8$

(d) $x^2 - 121 = 0$

Answer: $x = -11$ or $x = 11$

(e) $x^2 - 1 = 0$

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

(f) $x^2 - 400 = 0$

Answer: $x = -20$ or $x = 20$

7 Jo solves $(x - 3)(x + 2) = 0$ and writes " $x = 3$ or $x = 2$ ". Explain her mistake and write down the correct solutions.

Answer: $x = -2$ (not 2); correct: $x = 3$ or $x = -2$

8 How many solutions does each equation have? You do not need to find them.

(a) $(x - 1)(x + 4) = 0$

Answer: 2

(b) $(x - 6)^2 = 0$

Answer: 1

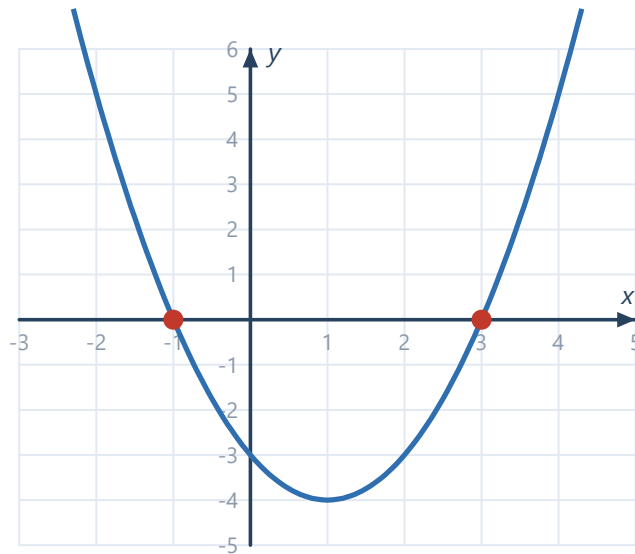
(c) $x(x - 2) = 0$

Answer: 2

(d) $x^2 + 4 = 0$

Answer: 0

- 9 The graph of $y = x^2 - 2x - 3$ is shown. Use the graph to write down the solutions of $x^2 - 2x - 3 = 0$. Then check your answer by factorising.



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

- 10 Find the x-coordinates of the points where the curve $y = x^2 + 4x - 5$ crosses the x-axis.

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

11 Solve.

(a) $x^2 + 9x + 18 = 0$

Answer: $x = -6$ or $x = -3$

(b) $x^2 - 3x = 0$

Answer: $x = 0$ or $x = 3$

(c) $x^2 - 49 = 0$

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

(d) $x^2 - 8x + 7 = 0$

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

(e) $x^2 + 5x - 14 = 0$

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

(f) $x^2 - 6x = 0$

Answer: $x = 0$ or $x = 6$

12 Solve.

(a) $(2x - 3)(x + 4) = 0$

Answer: $x = -4$ or $x = \frac{3}{2}$

(b) $(3x + 1)(x - 5) = 0$

Answer: $x = -\frac{1}{3}$ or $x = 5$

(c) $(5x - 2)(2x + 7) = 0$

Answer: $x = -\frac{7}{2}$ or $x = \frac{2}{5}$

(d) $x(4x - 3) = 0$

Answer: $x = 0$ or $x = \frac{3}{4}$

(e) $(2x - 1)^2 = 0$

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

(f) $(x - 2)(3 - x) = 0$

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

13 Solve.

(a) $3x^2 - 27 = 0$

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

(b) $2x^2 - 50 = 0$

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

(c) $4x^2 - 9 = 0$

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

(d) $25x^2 - 4 = 0$

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

(e) $5x^2 - 20x = 0$

Answer: $x = 0$ or $x = 4$

(f) $6x^2 + 9x = 0$

Answer: $x = -\frac{3}{2}$ or $x = 0$

14 Write down a quadratic equation, in the form $x^2 + bx + c = 0$, whose solutions are $x = 3$ and $x = -7$.

Answer: $x^2 + 4x - 21 = 0$

15 The equation $x^2 + kx + 16 = 0$ has exactly one solution. Find the two possible values of k .

Answer: $k = 8$ or $k = -8$

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