

Exercises – Quadratics ; Factor Method, Completing the Square

Solve by Inspection:

1. $x(x-2) = 0$

2. $(x-1)(x+2) = 0$

3. $(2x-5)(x+1) = 0$

Solve using the "Factor method":

4. $x^2 - 11x = 0$

5. $9x - 4x^2 = 0$

6. $5x^2 = 3x$

7. $x^2 - 9 = 0$

8. $4x^2 - 25 = 0$

9. $x^2 - x - 12 = 0$

10. $x^2 + 3x - 28 = 0$

11. $x^2 - 16x + 28 = 0$

12. $x^2 = 7x - 6$

13. $6x^2 + 11x + 4 = 0$

14. $8x^2 + 6 = 16x$

Solve by "Completing the square":

15. $x^2 + 8x = 9$

16. $x^2 - 10x + 24 = 0$

17. $x^2 + 6x + 1 = 0$

18. $2x^2 + 6x = 3$

Answers: (1) $x = 0, 2$ (2) $x = 1, -2$ (3) $x = 2.5, -1$ (4) $x = 0, 11$ (5) $x = 0, 2.25$ (6) $x = 0, 0.6$
(7) $x = 3, -3$ (8) $x = 2.5, -2.5$ (9) $x = 4, -3$ (10) $x = 4, -7$ (11) $x = 14, 2$ (12) $x = 1, 6$
(13) $x = -\frac{1}{2}, -\frac{4}{3}$ (14) $x = \frac{1}{2}, \frac{3}{2}$ (15) $x = -9, 1$ (16) $x = 6, 4$ (17) $x = -3 \pm 2\sqrt{2}$ (18) $x = \frac{-3 \pm \sqrt{15}}{2}$

Quadratic Formula – Exercises

Solving quadratics using the formula:-

The 2 possible solutions to: $ax^2 + bx + c = 0$ are $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

To find them:

Step 1: write down the values of the co-efficients **a**, **b** and **c** to start your working.

Step 2: Find the *discriminant*, $\Delta = b^2 - 4ac$ as a separate calculation.

Step 3: The solutions are $x_1 = \frac{-b + \sqrt{\Delta}}{2a}$ and $x_2 = \frac{-b - \sqrt{\Delta}}{2a}$

EXERCISE – Solve using the quadratic formula:

(1) $3x^2 - 7x - 2 = 0$

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

(3) $6x^2 - 10 = \frac{x}{2}$

(4) $n(2n + 9) = -3$

(5) $8x^2 = 5 - 6x$

(6) $2x^2 - 4x - 1 = 0$

Answers:

(1) $x = \frac{7 \pm \sqrt{73}}{6}$ (2) $x = -3 \pm 2\sqrt{3}$ (3) $x = \frac{4}{3}$ or $-\frac{5}{4}$ (4) $n = \frac{-9 \pm \sqrt{57}}{4}$

(5) $x = \frac{1}{2}$ or $-\frac{5}{4}$ (6) $x = \frac{2 \pm \sqrt{6}}{2}$