

Solve Quadratic Equations - All 4 Methods

Solve each equation by completing the square.

1) $b^2 + 2b + 11 = 0$

$$\{-1 + i\sqrt{10}, -1 - i\sqrt{10}\}$$

2) $b^2 - 10b + 21 = 0$

$$\{7, 3\}$$

3) $x^2 + 2x + 15 = 0$

$$\{-1 + i\sqrt{14}, -1 - i\sqrt{14}\}$$

4) $n^2 - 8n + 20 = 0$

$$\{4 + 2i, 4 - 2i\}$$

5) $n^2 - 2n - 11 = 4$

$$\{5, -3\}$$

6) $m^2 + 4m - 23 = -3$

$$\{-2 + 2\sqrt{6}, -2 - 2\sqrt{6}\}$$

7) $2r^2 - 4r - 6 = 0$

$$\{3, -1\}$$

8) $3p^2 + 6p + 2 = 0$

$$\left\{\frac{-3 + \sqrt{3}}{3}, \frac{-3 - \sqrt{3}}{3}\right\}$$

9) $3m^2 - 6m + 4 = 0$

$$\left\{\frac{3 + i\sqrt{3}}{3}, \frac{3 - i\sqrt{3}}{3}\right\}$$

10) $3x^2 - 6x - 9 = 0$

$$\{3, -1\}$$

Solve each equation by factoring.

11) $x^2 - 6x = 0$

$$\{6, 0\}$$

12) $a^2 - 2a - 8 = 0$

$$\{4, -2\}$$

13) $m^2 + m - 12 = 0$

$$\{3, -4\}$$

14) $a^2 - 2a - 35 = 0$

$$\{-5, 7\}$$

15) $2n^2 + 5n - 3 = 0$

$$\left\{\frac{1}{2}, -3\right\}$$

16) $5b^2 - 6b - 8 = 0$

$$\left\{-\frac{4}{5}, 2\right\}$$

17) $15x^2 + 18x + 3 = 0$

$$\left\{-\frac{1}{5}, -1\right\}$$

18) $3x^2 + x - 2 = 0$

$$\left\{\frac{2}{3}, -1\right\}$$

19) $2x^2 = -3x + 20$

$$\left\{\frac{5}{2}, -4\right\}$$

20) $21a^2 + 41a = -10$

$$\left\{-\frac{5}{3}, -\frac{2}{7}\right\}$$

Solve each equation by taking square roots.

21) $r^2 = -63$

$$\{3i\sqrt{7}, -3i\sqrt{7}\}$$

22) $x^2 = 16$

$$\{4, -4\}$$

23) $2x^2 = -10$

$$\{i\sqrt{5}, -i\sqrt{5}\}$$

24) $v^2 + 2 = -2$

$$\{2i, -2i\}$$

25) $x^2 + 3 = 56$

$$\{\sqrt{53}, -\sqrt{53}\}$$

26) $-5k^2 = 50$

$$\{i\sqrt{10}, -i\sqrt{10}\}$$

27) $4n^2 - 1 = 8$

$$\left\{\frac{3}{2}, -\frac{3}{2}\right\}$$

28) $6x^2 + 3 = 27$

$$\{2, -2\}$$

29) $6x^2 + 1 = 55$

$$\{3, -3\}$$

30) $4b^2 + 7 = -36$

$$\left\{\frac{i\sqrt{43}}{2}, -\frac{i\sqrt{43}}{2}\right\}$$

Solve each equation with the quadratic formula.

31) $x^2 - 3x - 4 = 0$

$$\{4, -1\}$$

32) $3r^2 + 2r + 2 = 0$

$$\left\{\frac{-1 + i\sqrt{5}}{3}, \frac{-1 - i\sqrt{5}}{3}\right\}$$

33) $5n^2 - 4n + 5 = 0$

$$\left\{\frac{2 + i\sqrt{21}}{5}, \frac{2 - i\sqrt{21}}{5}\right\}$$

34) $5v^2 + 2v - 2 = 0$

$$\left\{\frac{-1 + \sqrt{11}}{5}, \frac{-1 - \sqrt{11}}{5}\right\}$$

35) $2m^2 + 5m + 2 = 0$

$$\left\{-\frac{1}{2}, -2\right\}$$

36) $a^2 - 9 = 0$

$$\{3, -3\}$$

37) $2v^2 + 4 = -v$

$$\left\{\frac{-1 + i\sqrt{31}}{4}, \frac{-1 - i\sqrt{31}}{4}\right\}$$

38) $5m^2 = 7$

$$\left\{\frac{\sqrt{35}}{5}, -\frac{\sqrt{35}}{5}\right\}$$

39) $4n^2 + 2 = -1$

$$\left\{\frac{i\sqrt{3}}{2}, -\frac{i\sqrt{3}}{2}\right\}$$

40) $3m^2 + 4m = 1$

$$\left\{\frac{-2 + \sqrt{7}}{3}, \frac{-2 - \sqrt{7}}{3}\right\}$$