

Solving Quadratic Equations

Methods of Solving.

Method 1

$$\begin{aligned}x^2 &= 9 \\ \sqrt{x^2} &= \pm\sqrt{9} \\ x &= \pm 3\end{aligned}$$

Method 2

$$\begin{aligned}x^2 - 2x - 3 &= 0 \\ (x-3)(x+1) &= 0 \\ x-3=0 & \quad | \quad x+1=0 \\ x=3 & \quad | \quad x=-1\end{aligned}$$

Method 3 Completing the square

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

$$x^2 - 2x \quad \quad \quad = 4$$

$$x^2 - 2x + 1 = 4 + 1$$

$\frac{1}{2}$ of 2 squared = 1

$$(x-1)(x-1) = 5$$

$$(x-1)^2 = 5$$

$$\sqrt{(x-1)^2} = \pm\sqrt{5}$$

$$x-1 = \pm\sqrt{5}$$

$$x = 1 \pm \sqrt{5}$$

Method 4 Quadratic Formula

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

Discriminant is $b^2 - 4ac$

$b^2 - 4ac > 0$ - 2 real roots

$b^2 - 4ac = 0$ 1 real root

$b^2 - 4ac < 0$ no real roots