



KEY IDEA

Solving Quadratic Equations

By graphing

Find the x -intercepts of the graph of the related function $y = ax^2 + bx + c$.

Using square roots

Write the equation in the form $u^2 = d$, where u is an algebraic expression, and solve by taking the square root of each side.

By factoring

Write the quadratic equation $ax^2 + bx + c = 0$ in factored form and solve using the Zero-Product Property.

Solve each equation by graphing.

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

Solve each equation by graphing.

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

Solve each equation by graphing.

$$-12x + 9 = -4x^2$$

Solve each equation by graphing.

$$-\frac{1}{2}x^2 = 20 - 6x$$

Solving Quadratic Equations Algebraically



When solving quadratic equations using square roots, you can use properties of square roots to write your solutions in different forms. When a radicand in the denominator of a fraction is not a perfect square, you can multiply the fraction by an appropriate form of 1 to eliminate the radical from the denominator. This process is called *rationalizing the denominator*.

Solve each equation using square roots.

$$4x^2 - 31 = 49$$

Solve each equation using square roots.

$$3x^2 + 9 = 0$$

Solve each equation using square roots.

$$\frac{2}{3}x^2 + 14 = 20$$

Solve each equation using square roots.

$$\frac{2}{5}(x + 3)^2 = 5$$

Solve each equation using square roots.

$$\frac{3}{4}(x + 1)^2 = 10$$