Section 1.7 Solving Quadratic Equations

An equation that can be written in the form $ax^2 + bx + c = 0$ is a quadratic equation. In this section we will learn strategies for solving any quadratic equation.

Solve: $x^2 = 16$

Solve: $(2x + 3)^2 = 5$

Extracting Square Roots.
When possible, isolate a perfect square term by setting it equal to a constant and then simplify by setting the quantity that is squared equal to the positive and negative square root of the other side.

Solve: $2x^2 = x + 6$

Solve: $(x + 4)^2 = 13x + 10$

The Zero Factor Property and Factoring.
When possible, set the quadratic equal to zero and then factor the quadratic. Set each factor equal to zero and solve.

Solve: $2x^2 + 6x = 5$

Solve: $(x + 3)(x - 2) = 4x(x + 2)$

Quadratic Formula.
Write the quadratic in general form $ax^2 + bx + c = 0$ Then plug $a, b,$ and c into the formula below and simplify.

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