

The equation $ax^2 + bx + c = 0$ (with $a \neq 0$) is called a **quadratic equation**.

To Solve a Quadratic Equation by Factoring:

1. Write the equation with 0 on one side.
2. Factor the other side.
3. Use the zero factor property to set each factor equal to zero.
4. Solve the simpler equation.
5. Check the answers in the original equation.

Even-Root Property

If n is an even positive integer, then

$$x^n = k \quad \left\{ \begin{array}{ll} \text{is equivalent to } x = \pm \sqrt[n]{k} & \text{if } k > 0 \\ \text{is equivalent to } x = 0 & \text{if } k = 0 \\ \text{has no real solution} & \text{if } k < 0 \end{array} \right.$$

To Solve a Quadratic Equation $ax^2 + bx + c = 0$ by Completing the Square:

1. If $a \neq 1$, then divide each side of the equation by a .
2. Get only the x^2 and the x terms on the left-hand side.
3. Add to each side the square of $\frac{1}{2}$ of the coefficient of x .
4. Factor the left-hand side as the square of a binomial.
5. Apply the even-root property.
6. Solve for x .
7. Simplify.