

The Quadratic Formula:

$$ax^2 + bx + c = 0 \quad (a \neq 0) \quad \Rightarrow \quad x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

Summary of Methods for Solving  $ax^2 + bx + c = 0$ :

- Even-root Property (when  $b = 0$ )
- Factoring (when the polynomial can be factored)
- Completing the Square (always works)
- Quadratic Formula (always works, and faster than completing the square)

Number of Real Solutions of a Quadratic Equation  $ax^2 + bx + c = 0$ :

- Two real solutions if  $b^2 - 4ac > 0$
- One (repeated) real solution if  $b^2 - 4ac = 0$
- No real solution (two imaginary solutions) if  $b^2 - 4ac < 0$