Chapter 4 Section 4: Using the Quadratic Formula

- The standard form of a quadratic equation in one variable is \( ax^2 + bx + c = 0 \), where \( a \), \( b \), and \( c \) are real numbers and \( a \neq 0 \).
- A formula that ALWAYS WORKS that can find the solutions to a quadratic equation is called the __________________________ ________________.

The Quadratic Formula:

Let \( a \), \( b \), and \( c \) be real numbers such that \( a \neq 0 \). The solutions of the quadratic equation \( ax^2 + bx + c = 0 \) are

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

Example 1: Solve \( 3x^2 + 4x = 10 \) using the Quadratic Formula.

Example 2: Solve \( 4x^2 + 3x = -13x - 16 \) using the Quadratic Formula.
**Example 3:** Solve $5x^2 + 2x = -1$ using the Quadratic Formula.

- In the Quadratic Formula, the expression $b^2 - 4ac$ is called the _____________ of the associated equation ________________.

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

**Example 4:** Find the discriminant of the quadratic equation and describe the number and type of solutions of the equation.

a. $25x^2 - 20x + 4 = 0$  
   b. $x^2 + 2x + 6 = 0$  
   c. $x^2 + 2x - 3 = 0$