LESSON 17: The Quadratic Formula

☐ Quadratic equation in standard form: \( ax^2 + bx + c = 0 \)

☐ Quadratic formula for the solution of a quadratic equation in standard form

\[ x_1 = \frac{-b + \sqrt{b^2 - 4ac}}{2a} \quad \text{OR} \quad x_2 = \frac{-b - \sqrt{b^2 - 4ac}}{2a} \]

☐ To solve a Quadratic Equation (p. 755)

☐ Connecting the Concepts: The Four Methods to Solve Quadratic Equations

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Problem 1A – 1C: Solve the following quadratic equation using three different methods:

\[ x^2 = x + 6 \]

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1A. Method 1: Solve by factoring: \( x^2 = x + 6 \)

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1B. Method 2: Complete the Square: \( x^2 = x + 6 \)
1C. Method 3: Solve Graphically: \( x^2 = x + 6 \)

<table>
<thead>
<tr>
<th>LHS of Equals Sign</th>
<th>RHS of Equals Sign</th>
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<tr>
<td>( x )</td>
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<tr>
<td>(-2)</td>
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Problems 2 – 5: Solve the following quadratic equations for \( x \) using the method of completing the square.

2. \( x^2 = 4x - 4 \)
3. \[ 3p^2 = 18p - 6 \]

4. \[ x^2 = 3x + 5 \]

5. \[ 5x^2 = 13x + 18 \]
Problem 5 – 6: Derive the quadratic formula.

5. \(5x^2 + 8x + 3 = 0\)

6. \(ax^2 + bx + c = 0\)
Problem 7 – 10: Solve the following quadratic equations using the quadratic formula.

7. \( x^2 = 4x - 4 \)

8. \( 3p^2 = 18p - 6 \)
9. \( x^2 = 3x + 5 \)

10. \( 5x^2 = 13x + 18 \)