NAME

Module 13 Solving Quadratic Equations of One Variable
Lesson 4 Solving Quadratic Equations by Completing the Square

guided notes

Lesson Objectives

- Determine the constant that makes a quadratic trinomial a perfect square.
- Write a perfect square trinomial as the square of a binomial.
- Solve quadratic equations by completing the square.

Given the expression $x^2 + bx$, to complete the square:

- Find half of **b**.
- **Square** the result.
- **Add** that number to create a perfect square trinomial.

A perfect square trinomial of the form $x^2 + bx + \left(\frac{b}{2}\right)^2$ can be factored as $\left(x + \frac{b}{2}\right)^2$.

1. Complete the square. $x^2 - 5x +$ **$\frac{25}{4}$**
2. Factor: $x^2 - 5x + \frac{25}{4}$ **$\left(x - \frac{5}{2}\right)^2$**

To solve a quadratic equation by completing the square, follow these steps:

1. **Isolate** the variable terms on one side of the equation.
2. Make the leading coefficient equal to **one**.
3. Add $\left(\frac{b}{2}\right)^2$ to **both** sides of the equation. This completes the square and keeps the equation balanced.
4. **Factor**.
5. **Solve** by evaluating square roots.

3. Solve by completing the square. $x^2 + 6x + 2 = -6$ **{–2, –4}**