9.5 Notes **Completing the Square** **Name _____**

What do we need to add to these expressions to complete the square (create a perfect square)?

1. $x^2+6x+\_\_\_\_=(x+3)^2$
2. $x^2-8x+\_\_\_\_=(x-4)^2$
3. $x^2+10x+\_\_\_\_=(x+\_\_\_)^2$
4. $x^2-12x+\_\_\_\_=(x-\_\_\_)^2$

How did you find the c value in ax^2+bx+c ?

How do you get the constant in $(x+\_\_\_)^2$?

Ex. 1: Solve by completing the square.

$x^2-14x+16=0$

1) Isolate the ax^2+bx on one side.
2) Determine what you need to add to the left side to complete the square. **To keep the equation balanced, you need to add the same amount to each side.**
3) Write the left side as a squared binomial.
4) Solve the quadratic by taking the square root of both sides and continue to solve.

Ex. 2: Solve by completing the square.

$x^2+10x-9=0$

You Try! Solve by completing the square.

$x^2 - 8x - 6 = 0$

Ex. 3: Write in Vertex Form by Completing the Square.

Vertex Form: _____

$y = x^2 - 8x + 11$

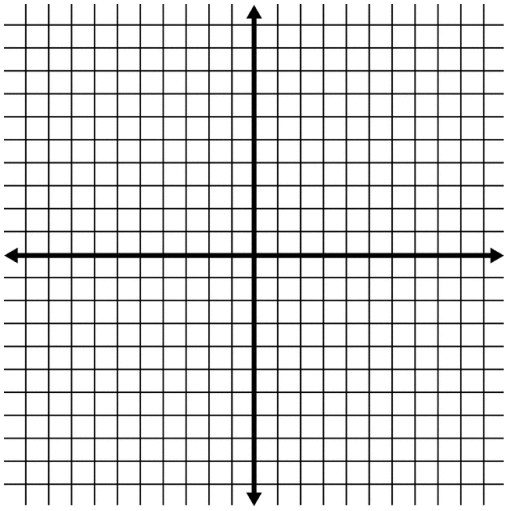
1) Isolate the $(ax^2 + bx)$

2) Complete the square in the parenthesis. **Subtract outside the parenthesis to keep the equation balanced.**

3) Simplify the parenthesis to a squared binomial

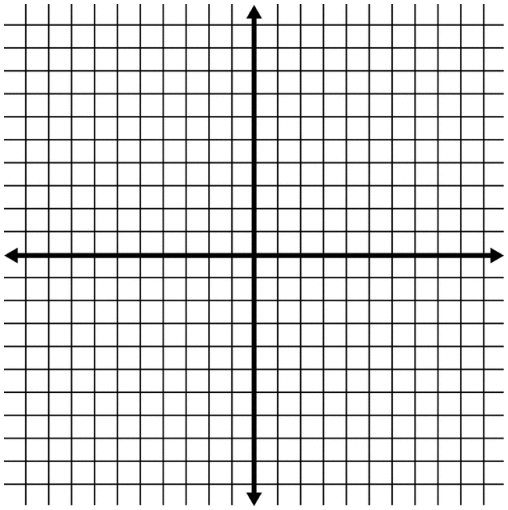
Ex. 4: Write in vertex form and graph.

$y = x^2 - 2x + 3$



Ex. 4: Write in vertex form and graph.

$y = x^2 + 6x + 2$



You Try! Write in vertex form and graph.

$y = x^2 - 4x + 1$