9.5 Notes **Completing the Square - when a doesn't equal 1**

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

1. $2x^2+16x+\_\_\_\_ = \_\_\_(x+\_\_\_\_)^2$

2. $3x^2-6x+\_\_\_\_ = \_\_\_\_(x-\_\_\_)^2$

How did you find the c value in ax^2+bx+c when there is a number in front of a?

Ex. 1: Solve by completing the square.

$2x^2-12x+16=0$

1) Isolate the ax^2+bx on one side.

2) Factor out the a from ax^2+bx

3) Determine what you need to add in the parenthesis to the right side to complete the square. **To keep the equation balanced, you need to add the same amount to each side, but be careful!!!**

4) Write the left side as a squared binomial.

5) Solve the quadratic by taking the square root of both sides and continue to solve.

Ex. 2: Solve by completing the square.

$4x^2 + 16x - 8 = 0$

You Try! Solve by completing the square.

$5x^2 + 10x - 15 = 0$

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

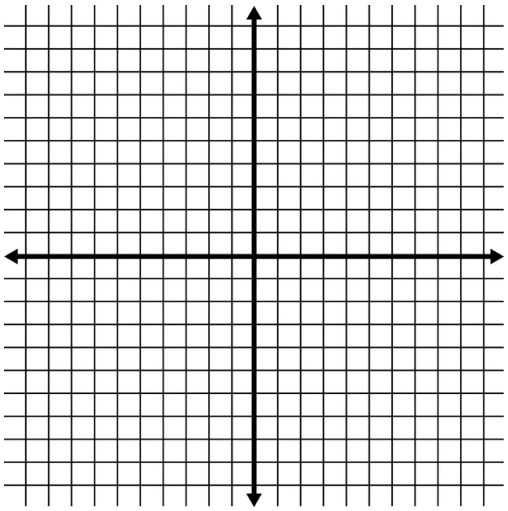
Vertex Form: _____

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

1) Isolate the $(ax^2 + bx)$
2) Factor out the a from $ax^2 + bx$
3) Complete the square in the parenthesis. **Subtract outside the parenthesis to keep the equation balanced. Again, remember to multiply what you are subtracting by a.**
4) Simplify the parenthesis to a squared binomial

Ex. 4: Write in vertex form and graph.

$y = 2x^2 - 4x + 5$



Ex.5: A hedge maze has a 2 yard wide walkway around it. What are the dimensions of the maze with the walkway, if the length of the hedge maze is twice as long as the width?