Name 2/11/2020 Hour _____ Date _____

Algebra 2: Equation of a Parabola, via "completing the square"

vertex form:	$y = \frac{1}{4p}(x - h)^2 + k$	$x = \frac{1}{4p}(y - k)^2 + h$
	vertical parabola	horizontal parabola

Warm-up

1.) What is the vertex of $y = 2(x + 1)^2 - 4$ (h, k)

V (-1, -4)

2.) What is the vertex of $x = ½ (y + 5)^2 + 8$

V(8, -5)

However, sometimes the equation isn't in this friendly vertex form!

There's another way to write the equation of a Parabola!!!

standard form: $y = ax^2 + bx + c$

Example 1: $x^2 + 12x + 26$ What is the vertex!?!?!?! Ugh… just like what we did with the circle, we have to "complete the square." Let's do it!

$x^2 + 12x + \boxed{36} + 26 \boxed{-36}$

Half, Squared

$(x+6)^2 - 10$ Vertex (-6, -10)

Example 2: $x^2 - 14x + 58$

$x^2 - 14x + \boxed{49} + 58 - \boxed{49}$

$(x-7)^2 + 9$ Vertex (7, 9)

* **Example 3**: $2x^2 + 8x + 12$

$2x^2 + 8x + \boxed{} + 12 - \boxed{}$

$2(x^2 + 4x + \boxed{4}) + 12 - \boxed{8}$

* $2(x+2)^2 + 4$ vertex: (-2, 4)