

Monday, November 16, 2020 - Algebra II Honors

Completing the square - Notes

Warm-Ups -

Look at each of the following patterns carefully:

$$x^2 + 6x + 9 = (x + 3)^2$$

$$x^2 + 10x + 25 = (x + 5)^2$$

$$x^2 - 8x + 16 = (x - 4)^2$$

Fill in the following blanks using the same mathematical patterns:

1) $x^2 + \underline{\quad}x + \underline{\quad} = (x + 2)^2$

2) $x^2 + \underline{\quad}x + 49 = (x + \underline{\quad})^2$

3) $x^2 + 12x + \underline{\quad} = (x + \underline{\quad})^2$

4) $x^2 - 16x + \underline{\quad} = (x - \underline{\quad})^2$

Using this pattern to convert from Standard form into Vertex form:

$$y = x^2 + 14x + 41$$

What if b is an odd number?

$$y = x^2 + 9x + 15$$

What if there is an a-value?

$$y = -2x^2 + 12x - 9$$

Quadratic Solving Strategy #4 - Completing the Square

We can use the pattern from today's warm-ups to create an equation that can be solved using perfect-squares & square roots.

Let's Practice:

$$p^2 - 14p + 33 = 0$$

- 1) Get all variable terms on the left, and all constant terms to the right.
- 2) On the left side, determine what you need to add to create a perfect-square trinomial.
- 3) Add that value to both sides.
- 4) Rewrite the left side as a binomial squared
- 5) Solve the equation by taking the square root.

Try Another:

$$x^2 + 8x + 7 = 15$$

Try another:

$$k^2 - 11k - 85 = -3$$

$$6k^2 + 16k - 70 = 2$$