5.1 Completing the Square

The process of completing the square allows you to change a quadratic equation from _____ form to _____ form.

standard form ⟵⟶ vertex form

$y = x^2 + 4x + 3$ ⟵⟶ $y = (x + 2)^2 - 1$

Ex. 1 Use tiles to complete the square for $y = x^2 + 2x + 7$.

STEPS

- Place the _____ term in the upper left to make a square .
- Place the _____ terms evenly to the right and below the x^2 term.
- Place the "_____" off to the side.
- Add "_____" to make a square...use the zero principle to place the same number of opposite "_____" off to the side.
- Write the expression in _____ form.

Ex. 2 Rewrite each equation in vertex form using tiles to complete the square.

a) $y = x^2 + 8x - 3$

b) $y = x^2 - 6x + 2$

What do you notice?

Example	Standard Form	Vertex Form	
	# of x-terms	# of x-terms	# of ones added
$y = x^2 + 2x + 7$			
$y = x^2 + 8x - 3$			
$y = x^2 - 6x + 2$			

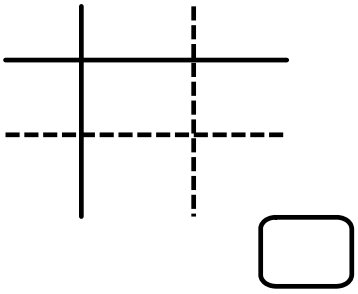
What kind of trinomial are you creating?

Can you do that without tiles?

We can use a chart instead of algebra tiles.

- The -----_____ and _____-terms will go in the chart.
- The _____ term will stay apart.

Ex. 3 Rewrite $y = x^2 + 8x - 3$ in vertex form by algebraically completing the square.

Chart	Algebraically
	$y = x^2 + 8x - 3$ What do we need to add to _____ to make it a perfect square trinomial? Factor the trinomial and simplify the constant terms.

Ex. 4 Rewrite each of the following in vertex form by completing the square with tiles, then algebraically.

a) $y = x^2 - 10x - 4$ Algebraically

b) $y = x^2 + 12x - 5$ Algebraically