

## 6.4 Complete the Square

Can be used to solve quadratic equations

We are going to use part of complete the square to put quadratic equations into vertex form

Vertex form is  $y = a(x-h)^2 + k$

A tells you how wide or skinny the graph is

h and k create the vertex

exponent of 2 tells me it is parabola

# Steps to Complete the Square

**Constant term must be on side by self**

**Find one half of  $b$ , the coefficient of  $x$**

**Square the result in above step**

**Add result of above step to both sides**

**Factor the trinomial and clean up other side**

**Move everything to left side set = to  $y$**

## Let's Try One Together

$$x^2 - 6x - 1 = 0$$

$$\frac{-6}{2} = -3$$

$$(-3)^2 = 9$$

$$x^2 - 6x + 9 = 1 + 9$$

$$(x-3)(x-3)$$

$$(x-3)^2 = 10$$

$$\begin{aligned} x-3 &= 0 \\ x &= 3 \end{aligned}$$

$$(x-3)^2 - 10 = y$$

## Try One on Your Own

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

$$(x-8)^2 - 68 = y$$

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put in vertex form  
give direction of graph  
give vertex