

COMPLETE THE SQUARE

Standard Form

$$y = ax^2 + bx + c$$

FACTORING

- multiply $(x-h)(x+h)$
- distribute a
- combine with k

- multiply with box method
- combine like terms

Vertex Form

$$y = a \cdot (x-h)^2 + k$$

Reflection (-) Stretch/comp.	Translation left/right (opposite)	Translate up/down
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- Tells us all transformations
- Vertex is at (h,k) h is opposite
- Does NOT tell us x or y intercepts

Factored Form

$$y = (x-m)(x-n)$$

Use the opposite signs	These are your x-intercepts
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- Tells us all x-intercepts $(m,0)$ $(n,0)$
* m and n have opposite signs
- $m \cdot n$ is the y-intercept $(0, mn)$
- Does NOT tell us transformations

Convert to **Vertex Form** $y = x^2 + 14x + 20$

How? Complete the Square

$$\frac{14}{2} = \boxed{7} \quad 7^2 = \boxed{49}$$

$$y = (x+7)^2 - 29$$

Convert to Factored Form: $y = 3x^2 + 7x - 6$

How? Factor

	<u>$3x$</u>	<u>-2</u>
<u>x</u>	$3x^2$	$-2x$
<u>3</u>	$9x$	-6

$$\begin{array}{c} \swarrow \quad \searrow \\ -18 \\ \swarrow \quad \searrow \\ \underline{-2x} + \underline{9x} = \underline{7x} \end{array}$$

$$(3x-2)(x+3)$$

Convert to Standard Form $y = (x - 3)^2 + 6$

How? Multiply

$$(x - 3)(x - 3) + 6$$

$$x^2 - 3x - 3x + 9 + 6$$

$$\boxed{x^2 - 6x + 15}$$