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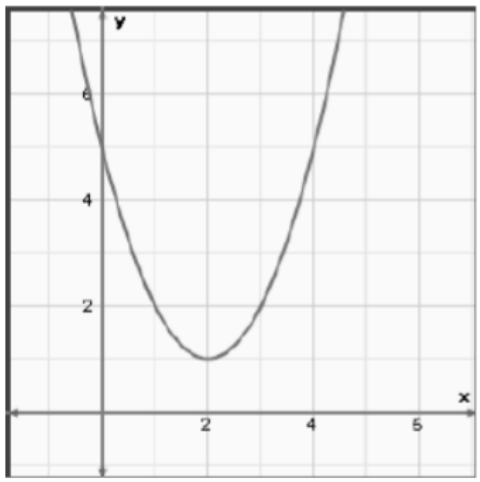
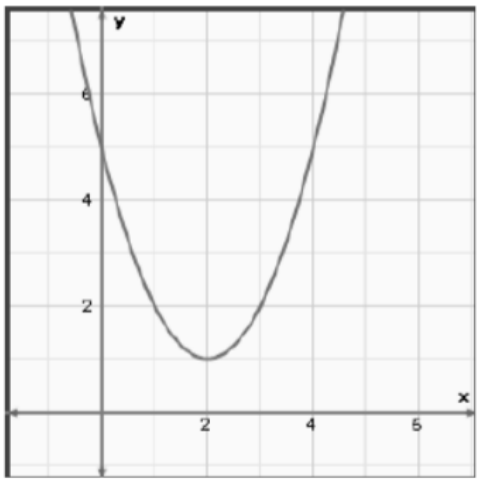
Converting Vertex Form to Standard Form

Quadratics can be written in different forms. Each form provides specific information about the quadratic.

Compare the graphs of the same quadratic when it is in vertex form and standard form:

$y=(x-2)^2+1$	$y=x^2-4x+5$
	

What information (about the key features of the parabola) can you take from each form?

- An equation in **standard form**, $y=ax^2+bx+c$, tells the location of the y-int.
- An equation in **vertex form**, $y=a(x-h)^2+k$, tells the location of the vertex, axis of symmetry and optimal value.

Vertex Form can be converted to **Standard Form** by expanding (FOIL).

$y=(x-2)^2+1$

$y=(x-2)(x-2)+1$

$y=x^2-2x-2x+4+1$

$y=x^2-4x+5$

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Example 1

Given the equation for a quadratic in vertex form, $y=-3(x+1)^2-4$

i. state the key features you can determine from vertex form
ii. expand the equation to put it into standard form
iii. state the key feature(s) you can determine from standard form

key features from vertex form	vertex = $(-1,-4)$ $a=-3$ opens down step : $-3,-9,-15$
expand	$y=-3(x+1)^2-4$ $y=-3(x+1)(x+1)-4$ $y=-3(x^2+1x+1x+1)-4$ $y=-3x^2-3x-3x-3-4$ $y=-3x^2-6x-7$
key features from standard form	y-int = $(0,-7)$