10.5 Extension

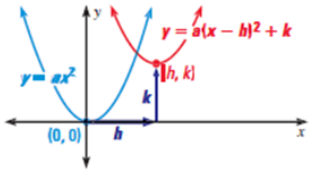
KEY CONCEPT *For Your Notebook*

Graph of Vertex Form $y = a(x - h)^2 + k$

The graph of $y = a(x - h)^2 + k$ is the graph of $y = ax^2$ translated h units horizontally and k units vertically.

Characteristics of the graph of $y = a(x - h)^2 + k$:

- The vertex is (h, k).
- The axis of symmetry is $x = h$.
- The graph opens up if $a > 0$, and the graph opens down if $a < 0$.



10.5 Extension- Example 1

Graph the quadratic function. Label the vertex and axis of symmetry.

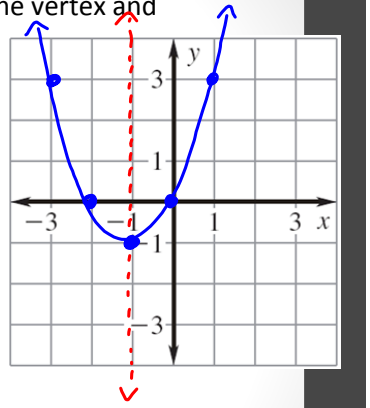
$y = (x + 1)^2 - 1$

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

a: 1 ↑ Vertex: (-1,-1)

h: -1 A.o.S: x=-1

k: -1



10.5 Extension- Example 2

Write the function in vertex form, then graph the function. Label the vertex and axis of symmetry.

$y = x^2 - 4x + 3$ $\left(\frac{-4}{2}\right)^2$

$0 = x^2 - 4x + 3$ $(-2)^2$

$-3 \quad -3$ 4

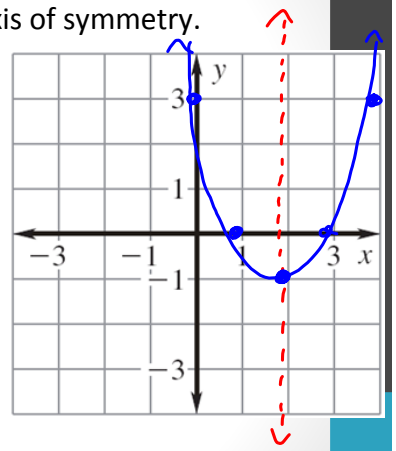
$-3 = x^2 - 4x$

$-3+4 = x^2 - 4x + 4$ V: (2, -1)

$1 = (x-2)^2$ A.o.S: x = 2

$-1 \quad +1$

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



p. 670 #'s 2, 4, 6, 7, 8, 9, 11