

§7-6 Vertex Form of a Quadratic Function

Standard form: $y = ax^2 + bx + c$

factored form: $y = a(x-r)(x-s)$

to graph \rightarrow x-intercepts (r and s)
y-intercept ($c = a \cdot r \cdot s$)
vertex

to get equation \rightarrow x-intercepts } solve for
a point (x,y) } a

11a
(p393) x-intercepts $(\overset{r}{6}, 0)$ $(\overset{s}{-2}, 0)$
y-intercept $(\overset{x}{0}, \overset{y}{-6})$

$$y = a(x-r)(x-s)$$

$$-6 = a(0-6)(0-(-2))$$

$$-6 = a(-6)(+2)$$

$$-6 = a(-12)$$

$$a = \frac{6}{12}$$

$$a = \frac{1}{2}$$

$$y = \frac{1}{2}(x-6)(x+2)$$

vertex form: $y = a(x-h)^2 + k$

the vertex is (h, k)

Example 1 (p410)

Sketch the graph of the following function:

$$f(x) = \underbrace{2}_{a}(x - \underbrace{3}_{h})^2 - \underbrace{4}_{k}$$

Since $a > 0$, graph opens up.

vertex: $(3, -4)$

axis of symmetry: $x = 3$

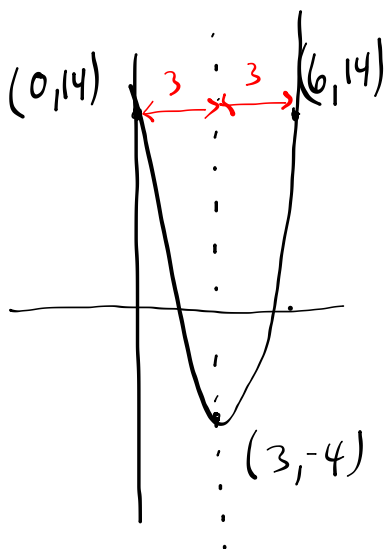
y-intercept: $f(0) = 2(0-3)^2 - 4$

$(0, 14)$

$$f(0) = 2(-3)^2 - 4$$

$$f(0) = 2(9) - 4$$

$$f(0) = 14$$



① vertex

② y-intercept

③ find a point to match y-intercept on other side of axis of symm.

TO DO

C4u (p 417)