

# Bellwork:

Factor:

$$2x^2 + 14x + 12$$

$$(2x + 2)(x + 6)$$
$$2(x + 1)(x + 6)$$

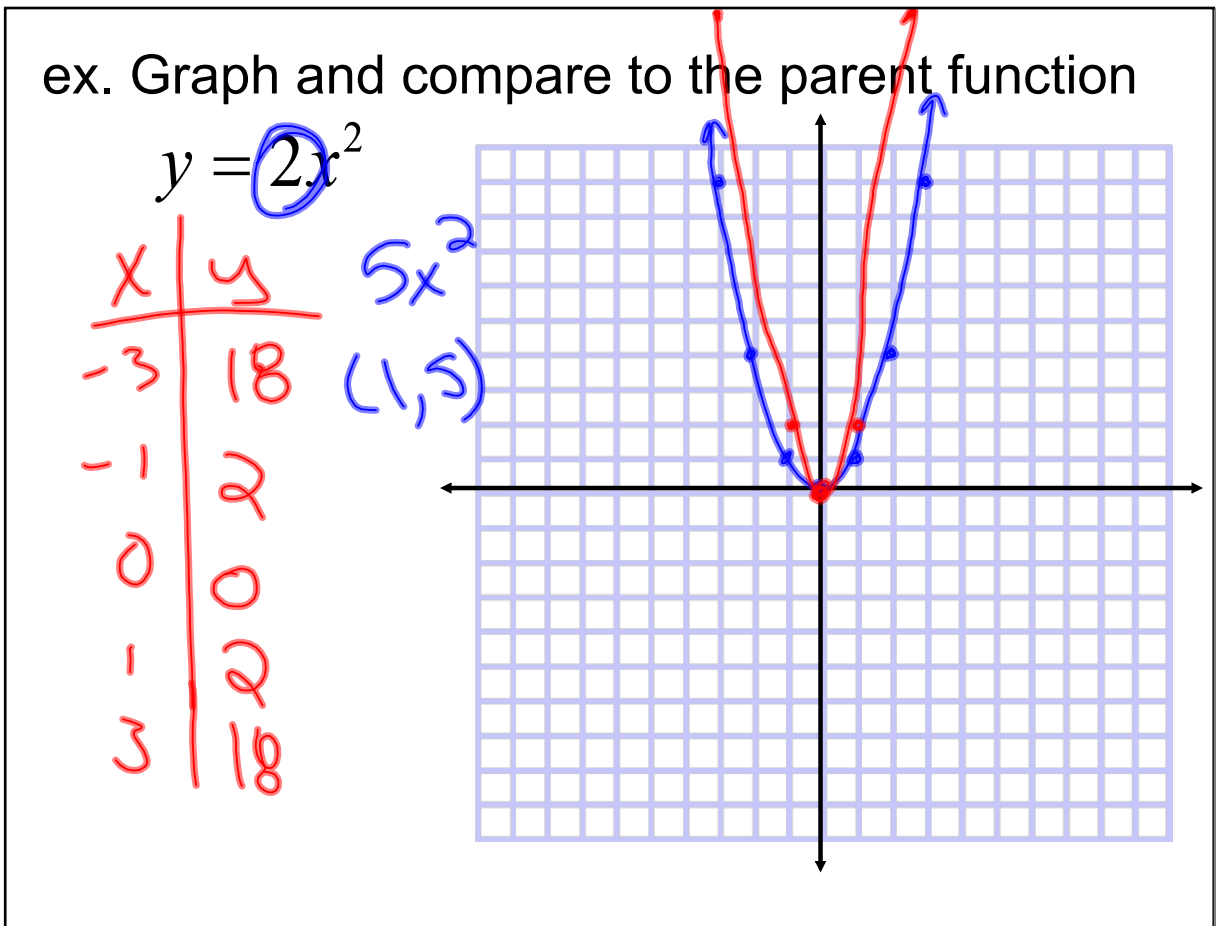
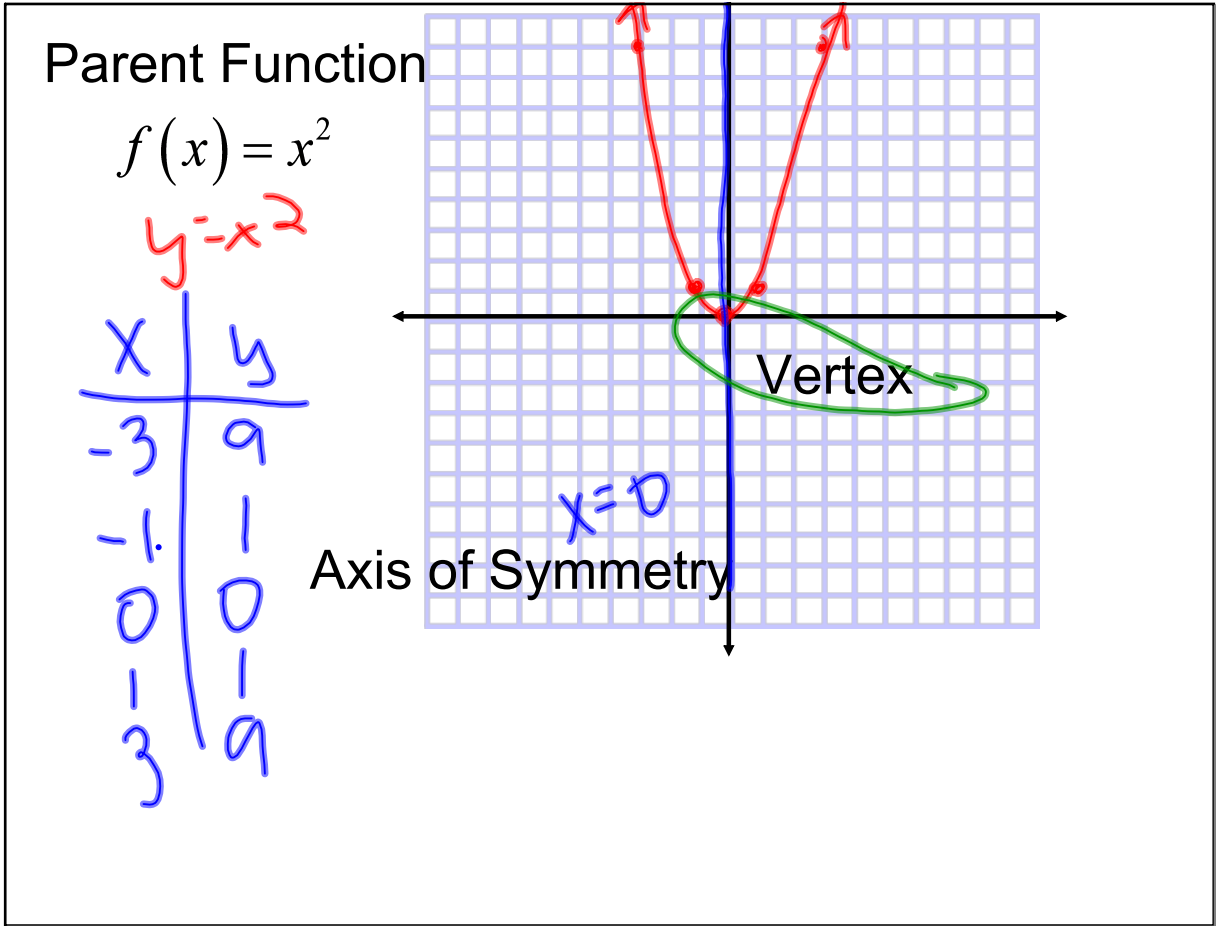
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## Chapter 4.1: Graph Quadratic Functions in Standard Form

- A quadratic function is a function that can be written in the standard form
- The graph of a quadratic forms a parabola.

$$y = ax^2 + bx + c, a \neq 0$$

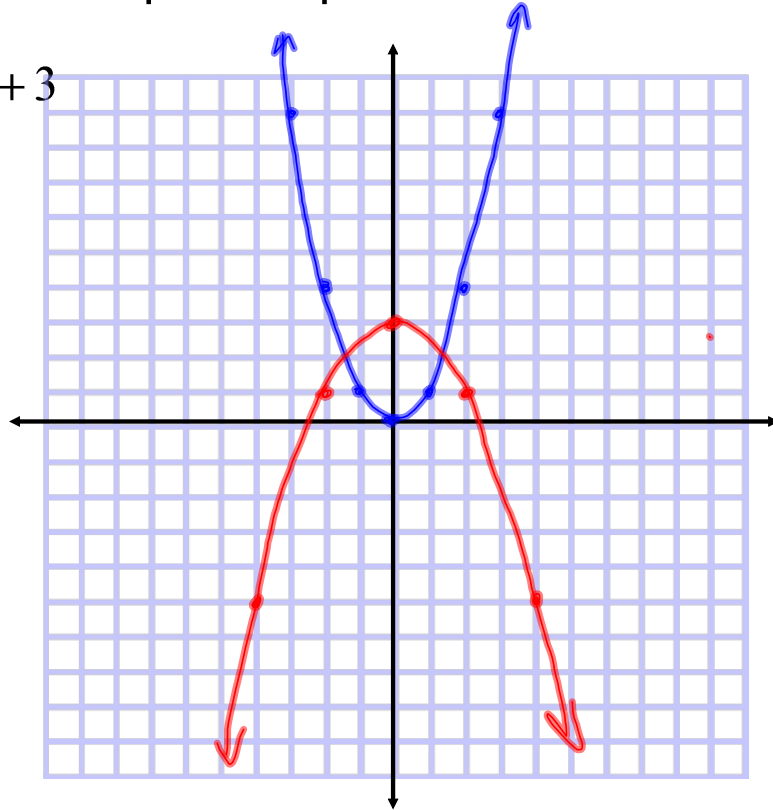
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ex. Graph and compare to parent function

$$f(x) = -\frac{1}{2}x^2 + 3$$

x	y
-4	-5
-2	-3
0	-3
2	-3
4	-5



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Properties:

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

if  $a < 0$  opens ~~up~~ <sup>down</sup>

if  $a > 0$  opens ~~down~~ <sup>up</sup>

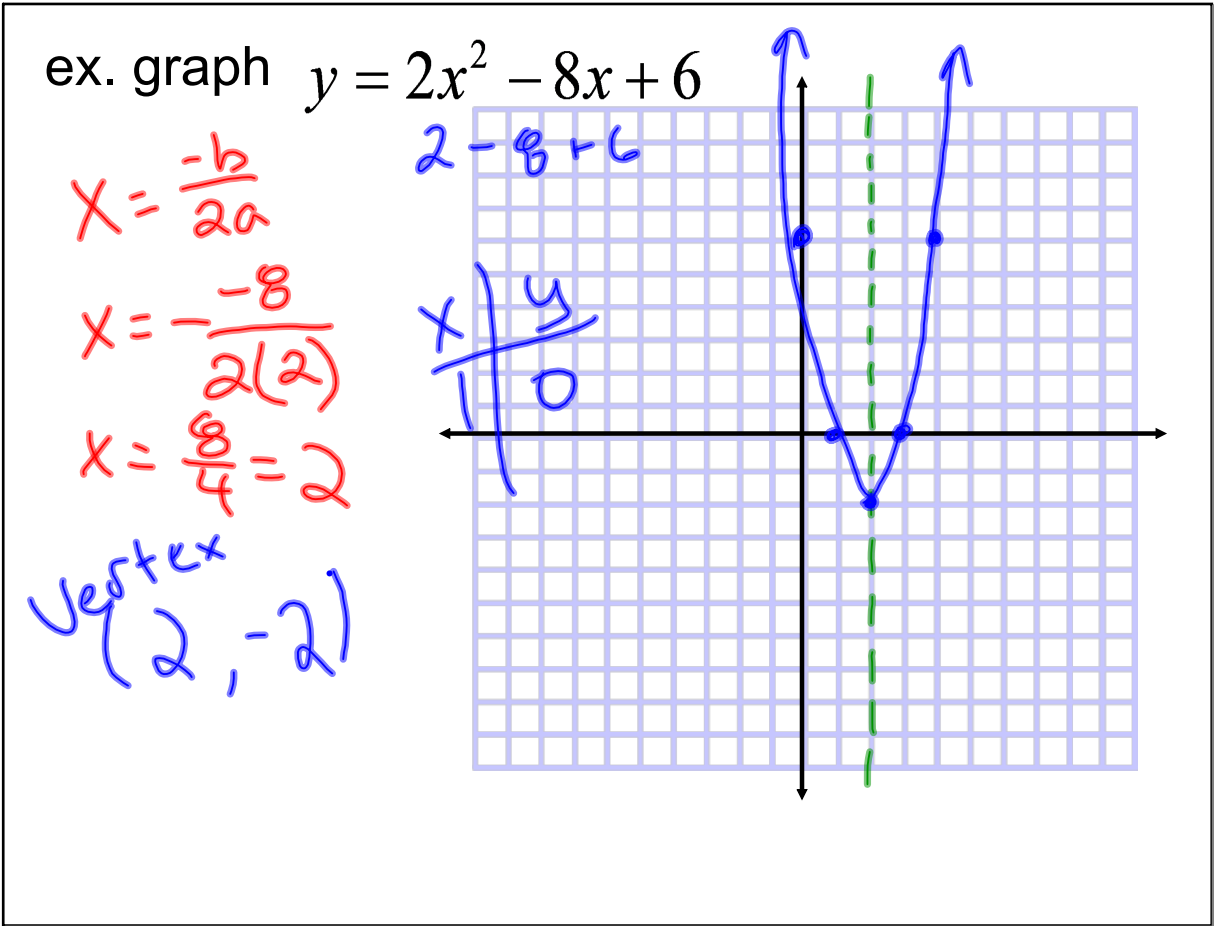
if  $a$  is a fraction, wider

if  $a$  is a whole number, narrower.

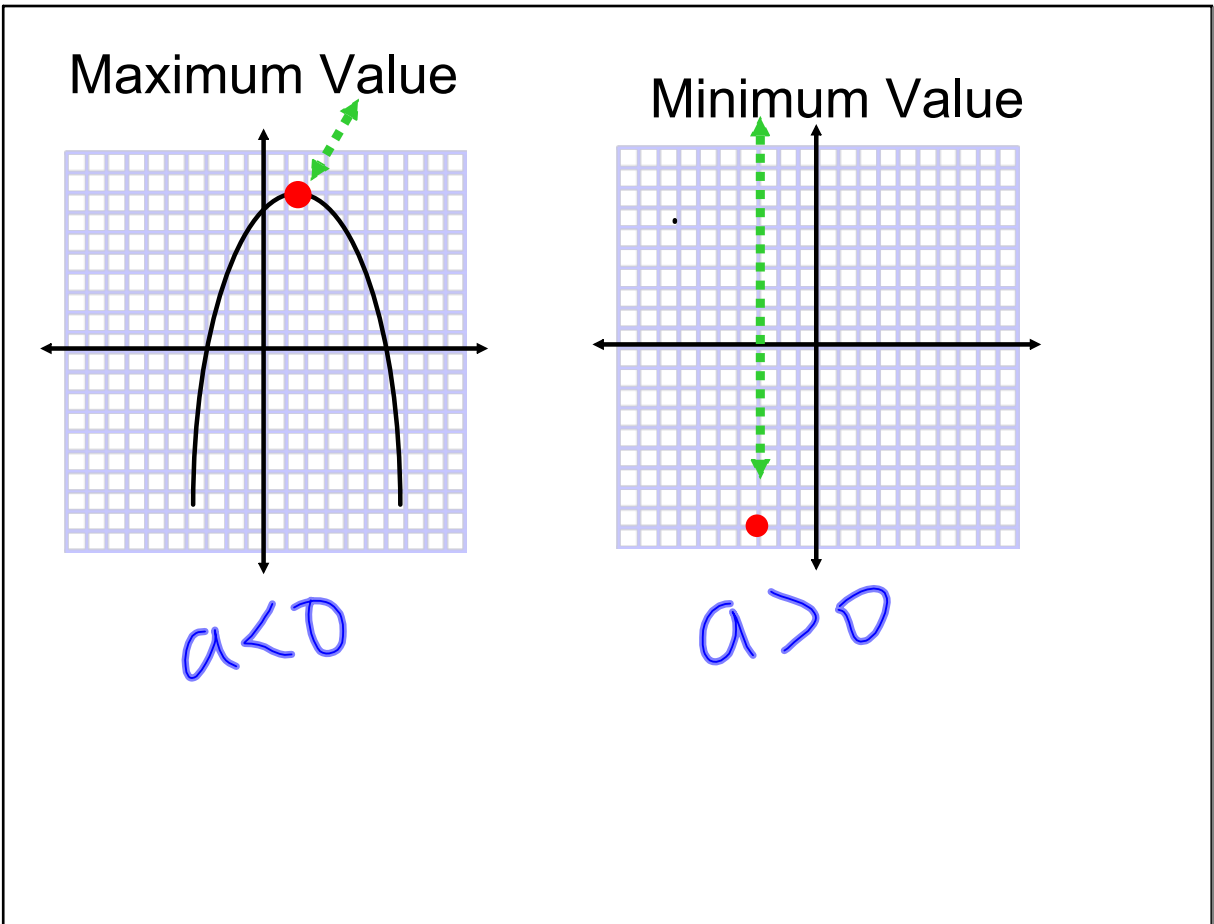
axis of symmetry  $\longleftrightarrow x = -\frac{b}{2a}$

y intercept  $\longleftrightarrow (0, c)$

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ex. Tell if there is a maximum or minimum value. What is it?  $y = 3x^2 - 18x + 20$



$$x = \frac{-b}{2a} = \frac{-(-18)}{2(3)} = \frac{18}{6} = 3$$

$$3(3)^2 - 18(3) + 20$$

$$27 - 54 + 20 = -7$$

min.  $(3, -7)$

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ex. A go-cart track has about 380 racers per week and charges each racer \$35 to race. The owner estimates that there will be 20 more racers per week for every \$1 reduction in the price per racer. How can the owner of the go-cart track maximize weekly value?

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Homework: Ch 4.1 pg.240  
#'s 4-18e, 22-28e, 34-46e

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