

# Algebra II

7-5

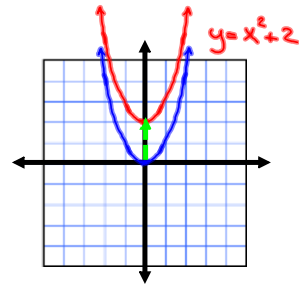
(Day 2)

## Quadratic Functions and Their Graphs

## Recapping yesterday's activity

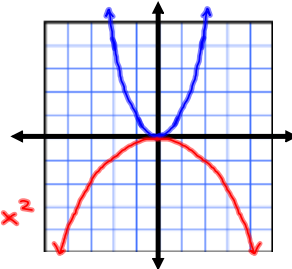
1) In the equation  $y = x^2 + k$ ,

$k$  causes the graph to slide up and down  
(called a vertical translation)



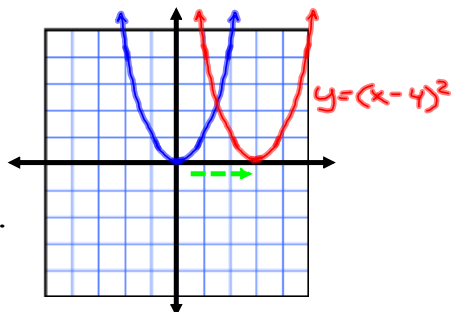
2) In the equation  $y = ax^2$ ,

if  $a$  is: negative - flips it upside down  
 $|a| > 1$ , makes it skinny  
 $0 < |a| < 1$ , makes it fat



3) In the equation  $y = (x - h)^2$ ,

$h$  causes the graph to slide left and right,  
opposite of what the sign would indicate.  
(called horizontal translation)

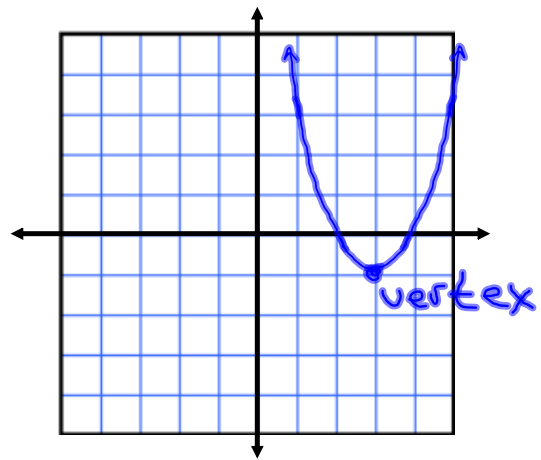


## Putting it all Together

Standard Form of a Quadratic Equation -

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

vertex  $(h, k)$



$$y = (x - 3)^2 - 1$$

$(3, -1)$

Graph each equation. Label the vertex and axis of symmetry. Find all intercepts. (pg. 331)

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

1)  $y = -3x^2$

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

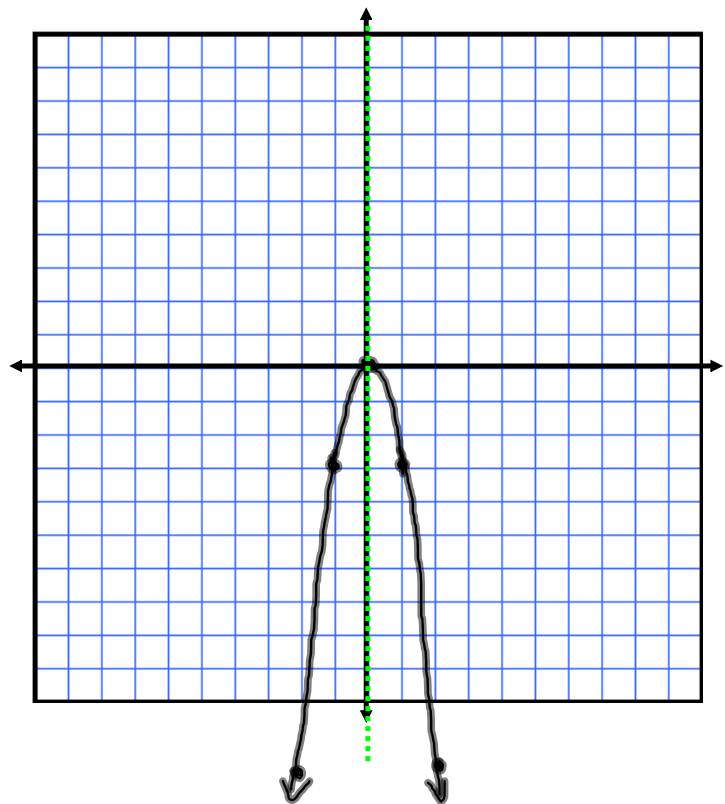
vertex  $(0,0)$

- $(1,-3)$
- $(2,-12)$
- $(-1,-3)$
- $(-2,-12)$

axis:  $x=0$

y-int:  $(0,0)$

x-int:  $\{0\}$



Graph each equation. Label the vertex and axis of symmetry. Find all intercepts.

11)  $y + 8 = \frac{1}{2}(x + 1)^2$

$y = \frac{1}{2}(x + 1)^2 - 8$

$(0, -7\frac{1}{2})$

$(1, -6)$

$(2, -3\frac{1}{2})$

$(3, 0)$

$(4, 4\frac{1}{2})$

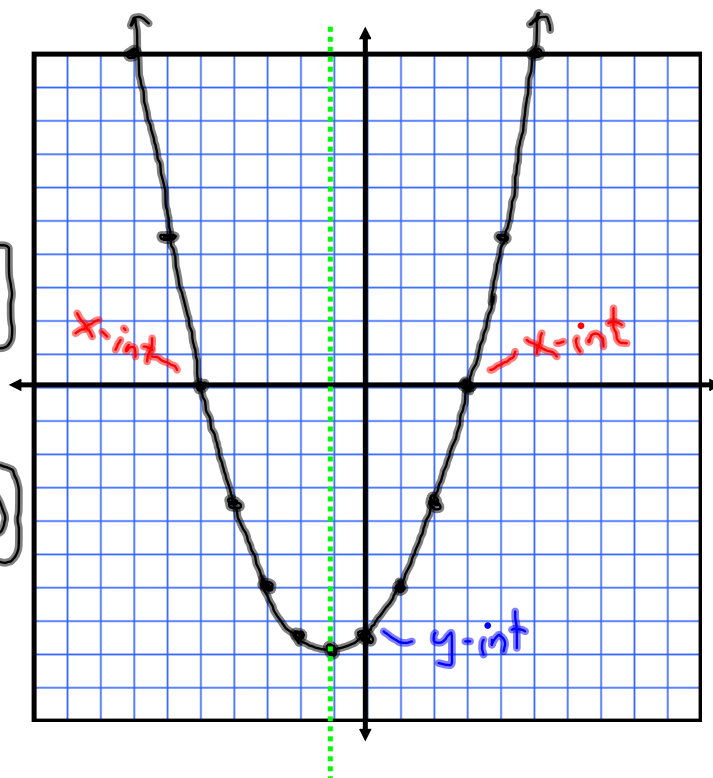
$(5, 10)$

vertex  $(-1, -8)$

axis:  $x = -1$

y-int:  $(0, -7\frac{1}{2})$

x-int:  $\{3, -5\}$



Find an equation in  $y = a(x - h)^2 + k$  for each parabola described.

19) Vertex  $(4, -3)$ , contains  $(2, -1)$

$$y = a(x - 4)^2 - 3$$

Temp

$$\begin{aligned} -1 &= a(2 - 4)^2 - 3 \\ -1 &= 4a - 3 \\ 2 &= 4a \\ \frac{1}{2} &= a \end{aligned}$$

$$y = \frac{1}{2}(x - 4)^2 - 3$$

Find an equation in  $y = a(x - h)^2 + k$  for each parabola described.

23) Vertex  $(3, 5)$ ,  $y$ -intercept  $2$   $(0, 2)$

$$y = a(x - 3)^2 + 5$$

Temp

$$\begin{aligned} 2 &= a(0 - 3)^2 + 5 \\ -3 &= 9a \\ -\frac{1}{3} &= a \end{aligned}$$

$$y = -\frac{1}{3}(x - 3)^2 + 5$$

What is the Standard Form good for? Finding the vertex  
Good For Graphing

What is the General Form good for?  
Good For solving.  
Ready For Quadratic Formula.

How do I find  $y$  - intercepts?  
1) Where it crosses the  $y$ -axis.  
2) Put zero in for  $x$ .

How do I find  $x$  - intercepts?  
1) Where it crosses the  $x$ -axis.  
2) Put zero in for  $y$ .

How do I find the axis of symmetry?  $x=h$



pg 331

2-30 even  
(skip 16) } 8 graphs