

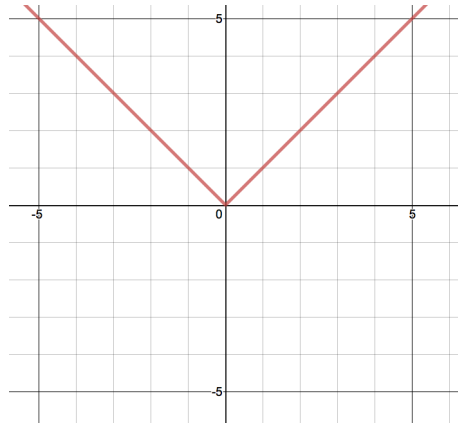
**Algebra 1**  
**8-1 Key Features of a Quadratic Function**

Name \_\_\_\_\_  
 Date \_\_\_\_\_ #1

**Goal:** Identify the key features of a quadratic function

**I. Review:** The parent function  $y = |x|$  is graphed on the coordinate plane. Graph the following functions on the same coordinate plane. Use the table for the first and the properties for the second.

a.  $g(x) = 2|x|$ , Domain: \_\_\_\_\_  
 Range: \_\_\_\_\_



$x$	$g(x) = 2 x $
-2	
2	
4	

b.  $h(x) = -2|x|$

“Slope”: \_\_\_\_\_

Domain: \_\_\_\_\_

Vertex: \_\_\_\_\_

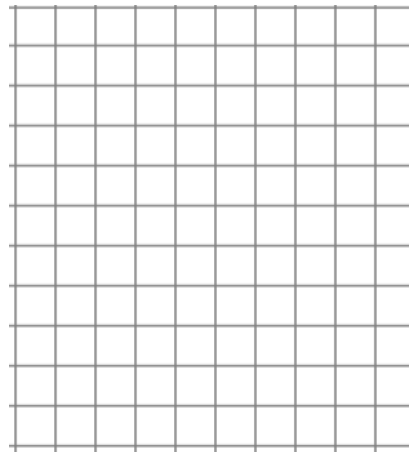
Range: \_\_\_\_\_

Open up or down?

**II. Quadratic Functions: Tables**

c. Make a table of values to graph the absolute value function  $y = x^2$ .

$x$	$y = x^2$
-2	
-1	
0	
1	
2	



Domain: \_\_\_\_\_

Range: \_\_\_\_\_

The function  $y = x^2$  called the \_\_\_\_\_ function. The shape of the graph is a \_\_\_\_\_. The turning point is called the \_\_\_\_\_ and the \_\_\_\_\_ divides the graph into two sections that are \_\_\_\_\_ of each other.

# Algebra 1

## 8-1 Key Features of a Quadratic Function

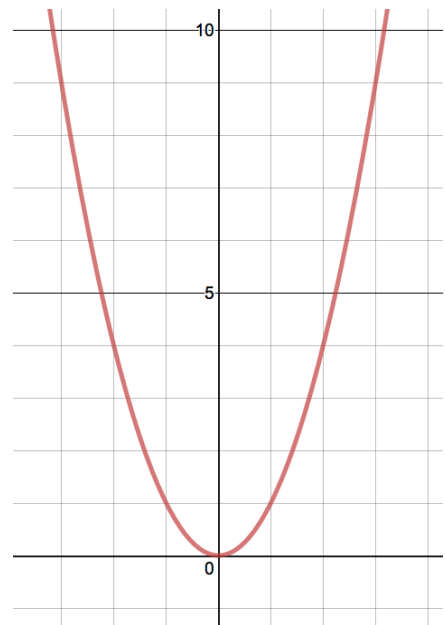
#1

Parabolas are used in engineering to focus waves and light. The path of a projectile is a parabola.

### III. Transform the Quadratic Function

A. How do the domain and range of  $g(x) = 2x^2$  compare to the domain and range of  $f(x) = x^2$

$x$	$f(x) = x^2$	$g(x) = 2x^2$
-2		
-1		
0		
1		
2		



What is the average rate of change for  $f(x) = x^2$  for  $-2 \leq x \leq -1$ ? For  $1 \leq x \leq 2$ ?

What is the average rate of change for  $g(x) = 2x^2$  for  $-2 \leq x \leq -1$ ? For  $1 \leq x \leq 2$ ?

For what values of the domain is the function  $f(x)$  increasing? Decreasing?

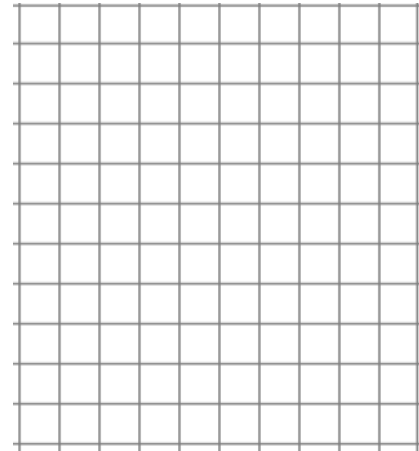
# Algebra 1

## 8-1 Key Features of a Quadratic Function

#1

**Try It! a.** How do the domain and range of  $h(x) = -x^2$  compare to the domain and range of  $f(x) = x^2$ ?

$x$	$f(x) = x^2$	$h(x) = -x^2$
-2		
-1		
0		
1		
2		



What is the rate of change for  $h(x) = -x^2$  for  $-2 \leq x \leq -1$ ? For  $1 \leq x \leq 2$ ?

For what values of the domain is the function  $h(x)$  *increasing*? *Decreasing*?

Scan the QR code to the right. Then adjust the slider to determine how  $a$  in  $f(x) = ax^2$  changes the shape of the graph of  $y = x^2$ .



When  $|a| > 1$ , the parabola is \_\_\_\_\_.

When  $-1 < |a| < 1$ , the parabola is \_\_\_\_\_.

When  $a > 0$ , the parabola opens \_\_\_\_\_.

When  $a < 0$ , the parabola opens \_\_\_\_\_.