

Name _____ Date _____

Graphing Quadratic Functions

(Pages 452–455)

In a quadratic function, the greatest power of the input variable (usually x) is 2. For example, $y = x^2$, $A = s^2$, and $y = 3x^2 + 5$ are all quadratic functions.

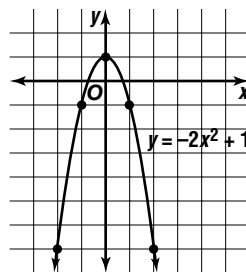
Graphing Quadratic Functions You graph a quadratic function with the same steps you used for graphing a linear function, but the graph of a quadratic function is a curve, not a straight line. The graphs of the quadratic functions in this lesson are all curves, called **parabolas**, shaped a little like the letter U.

EXAMPLE

Graph the quadratic function $y = -2x^2 + 1$.
Choose some values for x and make a table.

x	y	(x, y)
-2	$-2(-2)^2 + 1 = -7$	$(-2, -7)$
-1	$-2(-1)^2 + 1 = -1$	$(-1, -1)$
0	$-2(0)^2 + 1 = 1$	$(0, 1)$
1	$-2(1)^2 + 1 = -1$	$(1, -1)$
2	$-2(2)^2 + 1 = -7$	$(2, -7)$

Graph the (x, y) points in the last column of your table. Draw a smooth curve to join the points.



Because the graph is a curve, plot more points than you would for a straight line, so that you can see the shape of the curve.

Try These Together

1. Complete the function table and then graph the function $y = 2x^2$.

x	y	(x, y)
-2		
-1		
0		
1		
2		

HINT: The y -values repeat.

2. Complete the function table and then graph the function $f(x) = \frac{1}{2}x^2$.

x	$f(x)$	$(x, f(x))$
-4		
-2		
0		
2		
4		

HINT: Treat the $f(x)$ like y .

PRACTICE

- Graph $f(x) = 2x^2 - 5$.
- Graph the quadratic function $y = 12 - x^2$.



5. **Standardized Test Practice** Determine which ordered pair is a solution of $y = x^2 + x - 3$.

- A** (6, 9) **B** (2, -1) **C** (4, 17) **D** (-3, -15)

Answers: 1–4. See Answer Key for graphs. 1. $(-2, 8), (-1, 2), (0, 0), (1, 2), (2, 8)$ 2. $(-4, 8), (-2, 2), (0, 0), (2, 2), (4, 8)$ 5. C