

Algebra 1

3.4 Graphing Functions

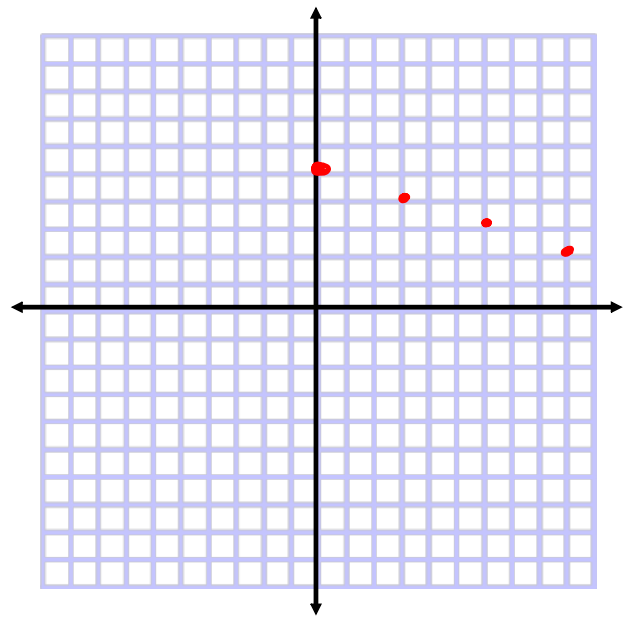
Graphing Functions Using a Given Domain

$$x + 3y = 15 \quad D: \{0, 3, 6, 9\}$$

$$\frac{3y}{3} = \frac{-x + 15}{3}$$

$$y = -\frac{1}{3}x + 5$$

x	y	$= -\frac{1}{3} \cdot 0 + 5$
0	5	$= -\frac{1}{3} \cdot 3 + 5$
3	4	$= -\frac{1}{3} \cdot 6 + 5$
6	3	$= -\frac{1}{3} \cdot 9 + 5$
9	2	$= -\frac{1}{3} \cdot 9 + 5$

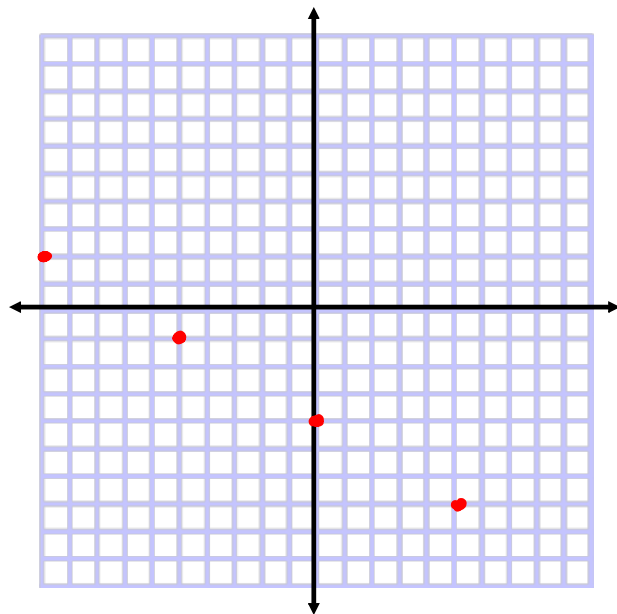


$$-3x - 5y = 20 \quad D: \{-10, -5, 0, 5\}$$

$$\frac{-5y}{-5} = \frac{3x + 20}{-5}$$

$$y = -\frac{3}{5}x - 4$$

x	y	$= -\frac{3}{5} \cdot -10 - 4$
-10	2	$= -\frac{3}{5} \cdot -5 - 4$
-5	-1	$= -\frac{3}{5} \cdot 0 - 4$
0	-4	$= -\frac{3}{5} \cdot 5 - 4$
5	-7	$= -\frac{3}{5} \cdot 5 - 4$



Graphing Functions Using a Domain of All Real Numbers

Graphing Functions Using a Domain of All Real Numbers	
Step 1	Use the function to generate ordered pairs by choosing several values of x .
Step 2	Plot enough points to see a pattern for the graph.
Step 3	Connect the points with a line or smooth curve.

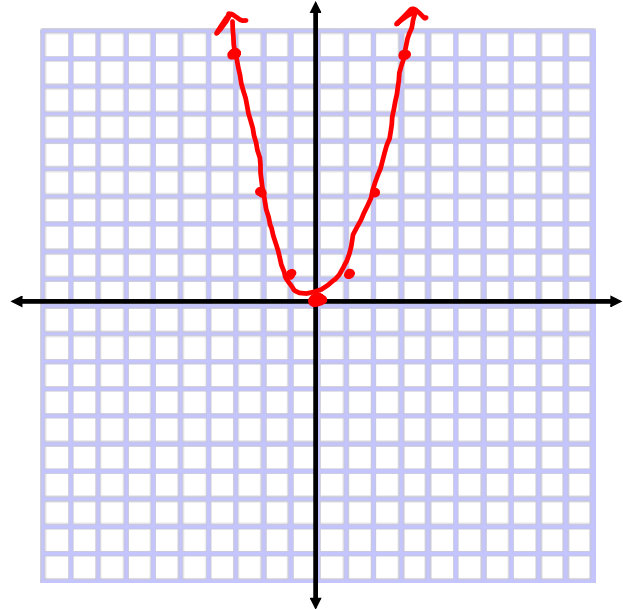
x	y
-1	1
-2	4
0	0
1	1
2	4
3	9
-3	9

$$y = x^2$$

$$(-1)^2 = -1 \cdot -1 = 1$$

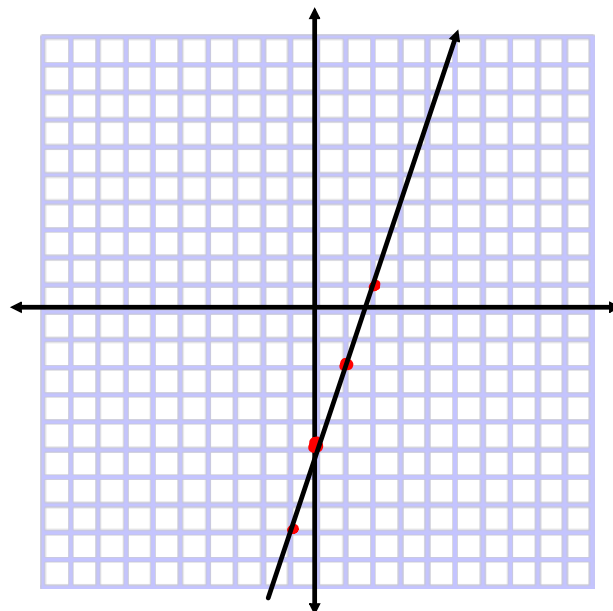
$$(-2)^2 = -2 \cdot -2 = 4$$

parabola



$f(x) = 3x - 5$ Linear

x	y	Calculation
-1	-8	$3(-1) - 5$
-2	-11	$3(-2) - 5$
0	-5	$3(0) - 5$
1	-2	$3(1) - 5$
2	1	$3(2) - 5$



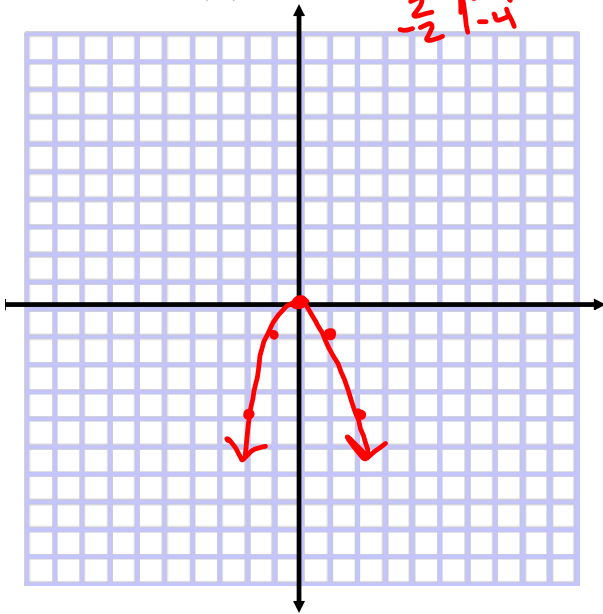
Your Turn

Graph each function.

$$y = -x^2$$

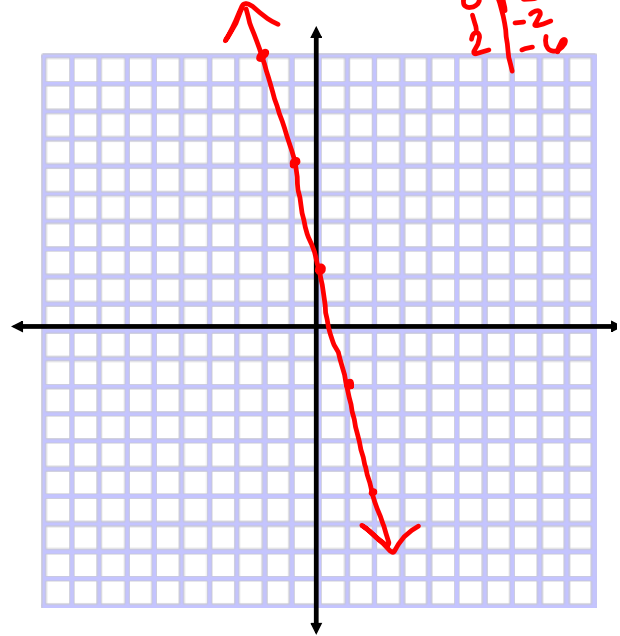
$$-1 \cdot x^2$$

x	y
-1	-1
0	0
1	-1
2	-4



$$y = -4x + 2$$

x	y
-2	8
-1	6
0	2
1	-2
2	-6

**Using a Graph to Find Values**Use a graph to find the value of $f(x)$ when $x = -2$ for each function.

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

Use a graphing calculator to graph $y = -\frac{1}{2}x + 3$, and use TRACE to find the function value when $x = -2$.

4

$$f(x) = \frac{3}{2}x - 4$$

-7

Your Turn

Use a graph to find the value of $f(x)$ when $x = 3$ for the function $f(x) = -x + 7$.

4

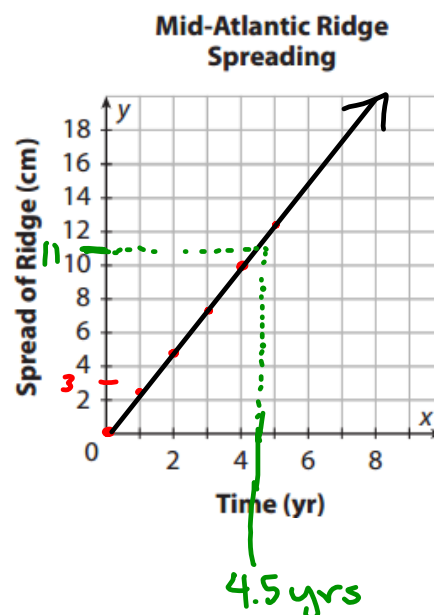
Modeling Using a Function Graph

The Mid-Atlantic Ridge separates the North and South American Plates from the Eurasian and African Plates. The function $y = 2.5x$ relates the number of centimeters y the Mid-Atlantic Ridge spreads after x years. Graph the function and use the graph to estimate how many centimeters the Mid-Atlantic Ridge spreads in 4.5 years.

$$y = 2.5x$$

x	y
0	0
1	2.5
2	5
3	7.5
4	10
5	12.5

about 11 cm
or
 ≈ 11 cm



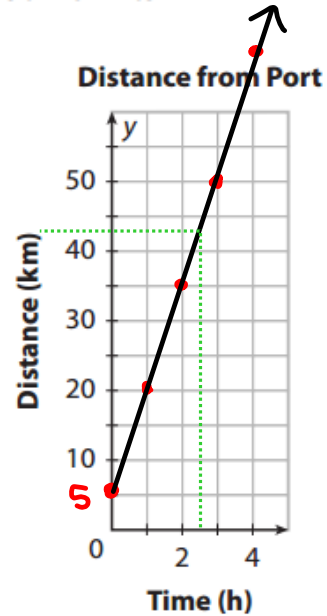
Your Turn

A cruise ship is currently 5 kilometers away from its port and is traveling away from the port at 15 kilometers per hour. The function $y = 15x + 5$ relates the number of kilometers y the ship will be from its port x hours from now. How far will the cruise ship be from its port 2.5 hours from now?

x	y
0	5
2	35
4	65
3	50
1	20

$$y = 15x + 5$$

$$\approx 42.5 \text{ km}$$



Homework

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