Lesson 6-5

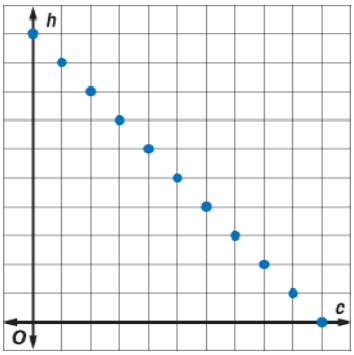
Example 1

RECREATION Ten students are going on a camping trip. On one of the afternoons, the students will be able to either go on a canoe ride or go horseback riding. Write an equation where c is the number of students who want to go on the canoe ride and h is the number of students who want to go horseback riding. Make a function table. Graph the data.

Solution

The relationship between the number of students who will participate in each activity is a function, written $f(c) = 10 - c$. As an equation, it is written $h = 10 - c$. Select domain values for a function table. Find the range.

c	h
0	10
1	9
2	8
⋮	⋮
9	1
10	0



Let the horizontal axis represent students who want to go canoeing and the vertical axis represent those who want to go horseback riding.

The graph shows the 11 possible combinations.

Example 2

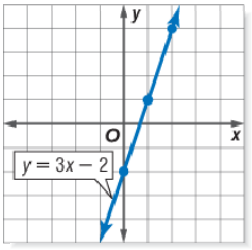
Graph each function when the domain is the set of real numbers.

a. $f(x) = 3x - 2$ **b.** $f(x) = -3$ **c.** $4x + y = 1$

Solution

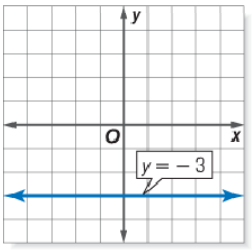
a. Make a table to show the ordered pairs. Choose at least three values of x from the domain. Calculate $f(x)$. Then graph the points that correspond to the ordered pairs, $(x, f(x))$. Draw a line to connect the points.

x	$f(x)$
0	-2
1	1
2	4



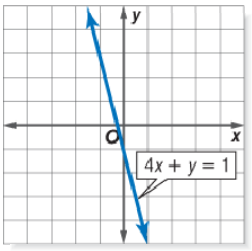
You can also think of the function as $y = 3x - 2$ and graph using the slope and y-intercept.

b. This function is written as $y = -3$. Recall that the graph of an equation in this form is a horizontal line. In this case, graph the horizontal line where $y = -3$.



c. Make a function table or solve the equation for y. Then graph using the slope and y-intercept.

$$\begin{aligned} 4x + y &= 1 \\ 4x - 4x + y &= 1 - 4x \\ y &= -4x + 1 \end{aligned}$$

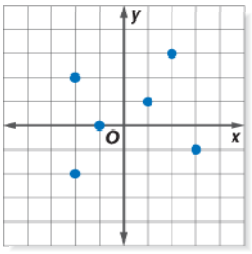


The slope is -4 and the y-intercept is 1.

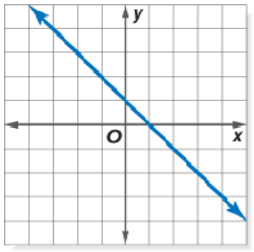
Example 3

Determine if each graph represents a function. Explain.

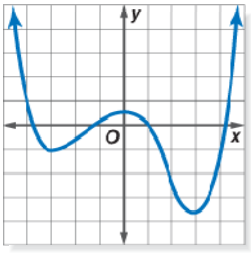
a.



b.

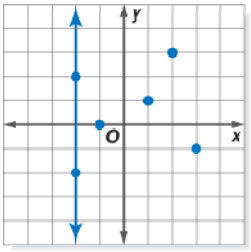


c.



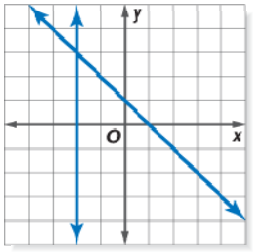
Solution

a.



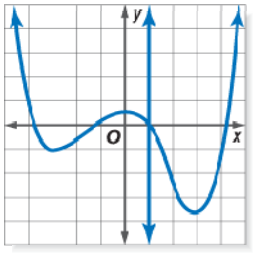
not a function

b.



function

c.



function

Example 4

Make a table or use your graphing utility to graph the nonlinear function $f(x) = x^3 + 1$.

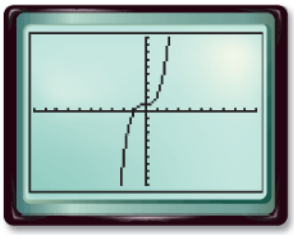
Solution

To use your graphing utility, enter $y = x^3 + 1$ at the equation screen and then graph. Notice the graph is a curve.

Set up a table that includes positive and negative values for x.

Substitute each x value into the equation and solve for the $f(x)$ value.

x	-2	-1	0	1	2
$f(x)$	-7	0	1	2	9



[−10, 10] scl: 1 by [−10, 10] scl: 1

Plot each point on a coordinate plane. Since no domain was stated, it is the set of real numbers. Since there are no values for which the function is not defined, the function is continuous.