3.6 Function Notation and Linear Functions

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Objectives:

- Use function notation.
- Graph linear and constant functions.

Function Notation

- When a function *f* is defined with a rule or an equation using *x* and *y* for the independent and dependent variables, we say, "*y* is a function of *x*" to emphasize that *y depends on x*. We use the notation

  called **function notation,** to express this and read *f(x) as "**f* **of** ***x*.**"

Evaluating a Function

- Let $f(x) = 6x - 2$, find $f(2)$.

Evaluating a Function

- Let $f(x) = -3x^2 + 2x$, find
  - $f(elephant)$
  - $f(pig)$

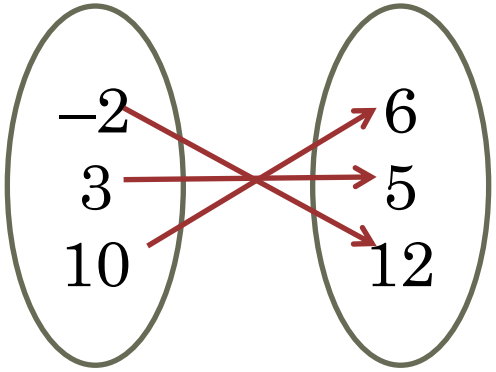
- Let $f(x) = \frac{-3x+5}{2}$, find (a) $f(-3)$ and (b) $f(t)$.

- Sometimes letters other than *f*, such as *g*, *h*, *or capital letters F, G, and H are used to name functions.*
- Let $g(x) = 5x - 1$, find and simplify $g(m + 2)$.

Evaluating Functions

- For each function, find $f(3)$.

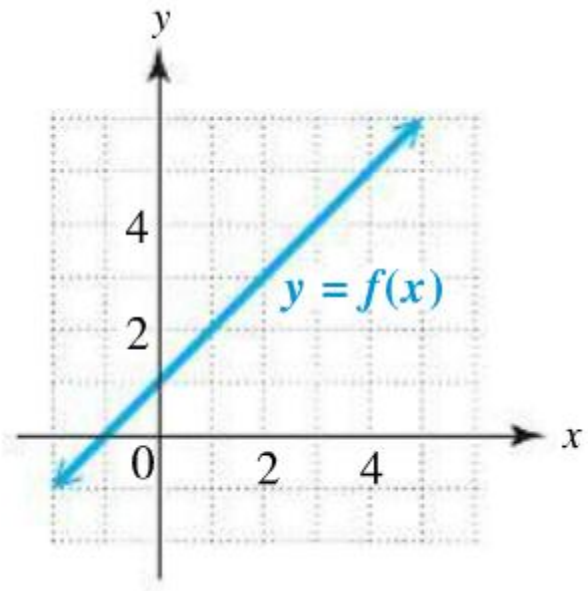
$$f = \{(-3,5),(0,3),(3,1),(6,-1)\}$$



Evaluating Functions

- For each function, find $f(3)$.

x	y
6	–12
3	– 6
0	0
–3	6



For what value of x does $f(x) = 2$?

For what value of x does $f(x) = 0$?

Finding an Expression for $f(x)$

Step 1

Step 2

- Rewrite the equation $x^2 - 4y = 3$ using function notation $f(x)$. Then find $f(1)$ and $f(a)$.

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

- Then find $f(1)$ and $f(a)$.

- Rewrite the equation $-2x + 5y = 9$ using function notation $f(x)$. Then find $f(1)$ and $f(a)$.

Linear Function

A function that can be defined by

For real numbers a and b is a **linear function.** The value of a is the slope m of the graph of the function. The domain of any linear function is

- Graph each function. Give the domain and range.

(a) $f(x)=\frac{1}{4}x-5$

(b) $f(x)=3$