Date: **Section:** 1.3

Objective: Use function notation to answer questions about graphs and to evaluate values of a function using its equation.

**Function Notation**

Input x

$f(x)$ is another way of writing y.

- $f(2)$ means the output from function f when $x = 2$.
  - If the function is represented by an equation, replace *all* the x's with 2's and simplify.
  - If you have a graph of the function, find the point on the graph with an x-coordinate of 2 and give the y-coordinate of that point.

Output
y = f(x)

- If the problem tells you that $f(x) = 5$, that means that the output or y-value is 5 when you plug in some value of x.
  - If the function is represented by an equation, replace $f(x)$ or y with 5 and solve for x.
  - If you have a graph of the function, find the point(s) on the graph with a y-coordinate of 5 and give the x-coordinate(s).
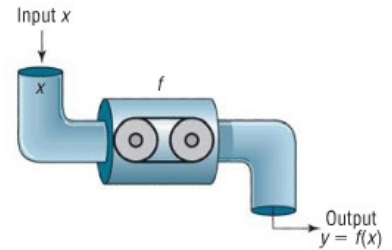
Example: The graph of $y = f(x)$ is shown below. Use it to answer the following.

a) Find $f(-3)$.

b) Find $f(2)$.

c) For what value(s) of x is $f(x) = 1$?

d) For what value(s) of x is $f(x) = -3$?

e) What is the domain of f?

f) What is the range of f?
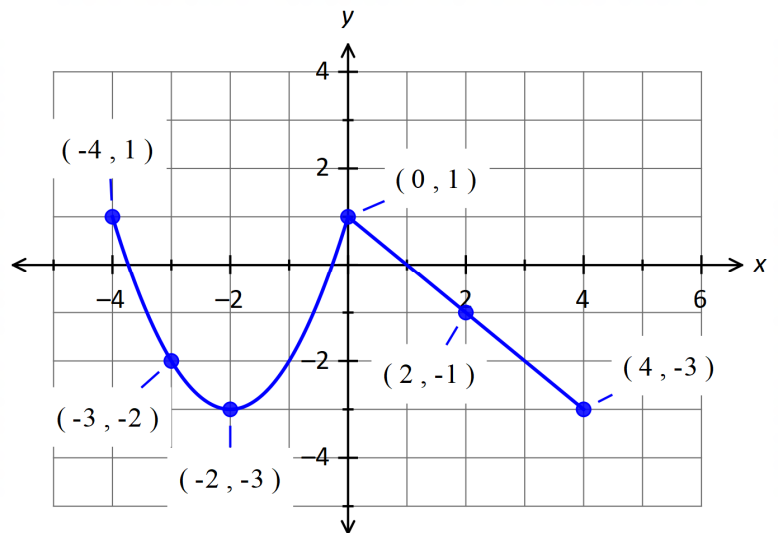
Example: The graph of $y = g(x)$ is shown below. Use it to answer the following.

a) Find $g(0)$.

b) Find $g(-3)$.

c) For what value of x is $g(x) = 0$?

d) For what value of x is $g(x) = 6$?

e) What is the domain of g?

f) What is the range of g?
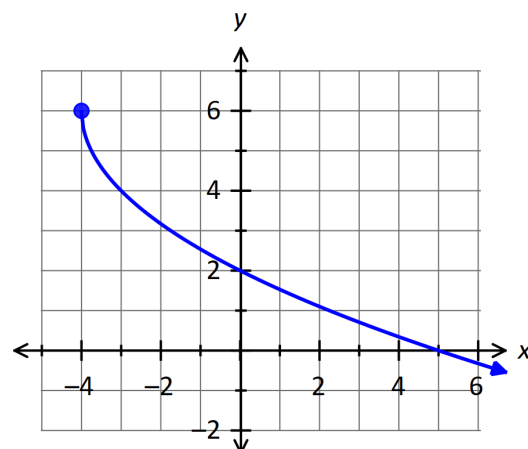
REVIEW: Order of Operations

Examples: Simplify the following expressions. Show each step.

a) -4^2

b) $(-4)^2$

c) $-(1-3)^2$

d) $-2(3)^2$

e) $-3 \cdot (-2)^2 + 4$

f) $2|5-3|$

g) $|6-10|-2$

h) $\dfrac{2+6}{-4}$

i) $\dfrac{8}{2(5)+6}$

Examples: Find each value if $f(x) = x^2 - 2x + 3$, $g(x) = 3x - 5$, and $h(x) = \dfrac{x}{4-2x}$. Leave your answers as simplified fractions, if necessary. Show all your work.

a) $f(2)$

b) $g(-1)$

c) $h(4)$

d) $g\left(\dfrac{2}{3}\right)$

e) $f(-5)$

f) $h(-3)$