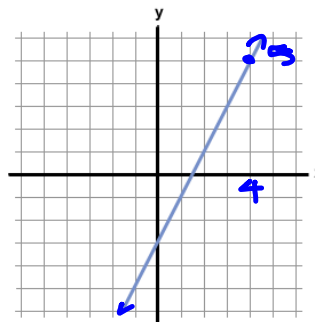


## Functional Notation

Recall:

A function can be represented by:

- a graph
- a set of ordered pairs or table
- a rule or equation



Consider  $y = 2x - 3$

What is the value of  $y$  when  $x = 4$ ?

How can we write this in a shorter way?

Faster!  $y(4)$

$$y = 2(4) - 3$$

$$y = 5$$

Ex) Given  $y(x) = 3x - 4$ , find  $y(-1)$ .

$$y(-1) = 3(-1) - 4$$

$$y = -7$$

The problem..  $y = 2x - 1$

$$y(x) = 2x - 1$$

$$y = -4x + 3$$

$$y(x) = -4x + 3$$

We can use other letters (f, g, h, etc.) to make the "y's"

look different.  $f(x) = 2x - 1$

$$g(x) = -4x + 3$$

ex 1) Find: a)  $f(-2)$

$$f(-2) = 2(-2) - 1$$

$$= -5$$

b)  $g(-2)$

$$g(-2) = -4(-2) + 3$$

$$= 11$$

ex 2) Given  $f(x) = 2x - 2$ . Find  $x$  if:

a)  $f(x) = 10$

$$10 = 2x - 2$$

$$+2 \quad +2$$

$$\frac{12}{2} = \frac{2x}{2} \quad x = 6$$

b)  $f(x) = -4$

$$-4 = 2x - 2$$

$$+2 \quad +2$$

$$\frac{-2}{2} = \frac{2x}{2} \quad -1 = x$$

ex 3) Given  $g(x) = -3x + 5$ . Find  $x$  if:

a)  $g(x) = 8$

$$8 = -3x + 5$$

$$-5 \quad -5$$

$$3 = -3x$$

$$-1 = x$$

b)  $g(x) = -1$

$$-1 = -3x + 5$$

$$-6 = -3x$$

$$x = 2$$

ex 4) Write as an equation in two variables.  
(not functional notation)

a)  $f(x) = 3x + 1 \rightarrow y = 3x + 1$

b)  $C(n) = 6 - n \rightarrow C = 6 - n$

c)  $t(d) = 2d \rightarrow t = 2d$

ex 5) Rewrite in functional notation.

a)  $y = x + 2 \rightarrow f(x) = x + 2$

b)  $C = 10n - 1 \rightarrow C(n) = 10n - 1$

c)  $t = 15d \rightarrow t(d) = 15d$

**Independent Variable**

= Variable whose values are freely chosen.

**Dependent Variable**

= Variable whose value depends on the independent variable

ex 6) The equation  $C = 25n + 100$  represents the cost,  $C$ , in dollars, for a feast following a sports competition, where  $n$  is the number of people attending.

a) Write the equation in function notation.

$$C(n) = 25n + 100$$

b) State the independent and dependent variables.

Domain  $x$   $\rightarrow$   $IV = n$ , number of people  $\quad DV = C$ , cost  $\leftarrow$  Range  $y$

c) Determine the value of  $C(100)$ . What does this number represent?

$$C(100) = 25(100) + 100 \\ = \$2600$$

The cost when 100 people attend.

d) Determine the value of  $C(n) = 5000$ . What does this number represent?

$$C(n) = 25n + 100 \\ 5000 = 25n + 100 \\ 4900 = 25n \\ \frac{4900}{25} = \frac{25n}{25}$$

$$n = 196 \text{ people}$$

The number of people when the cost was \$5000.