

$$a^2 + b^2 = c^2$$

$$12^2 + b^2 = 20^2$$

$$\begin{array}{r} \cancel{244} + b^2 = 400 \\ -\cancel{44} \qquad \qquad \qquad - \underline{\cancel{44}} \end{array}$$

$$\sqrt{b^2} = \sqrt{256}$$

$$b = 16 \text{ in.}$$

1-7 Functions

function - a relationship between an input and an output.

Each input has exactly ONE output!

$(5, 2)$ $(5, 6)$ $(3, -2)$ $(0, -2)$

Input	Output
5	2
5	6
3	-2
0	-2

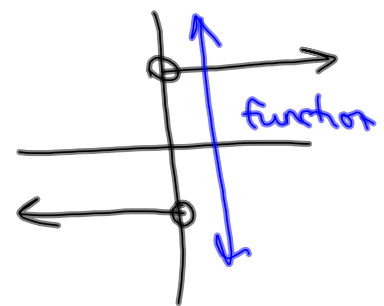
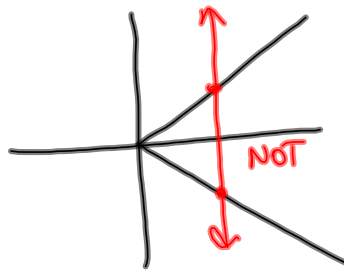
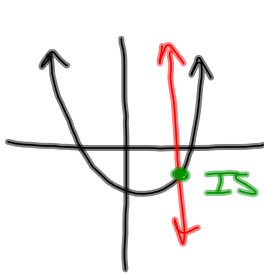
NOT a function

ok function

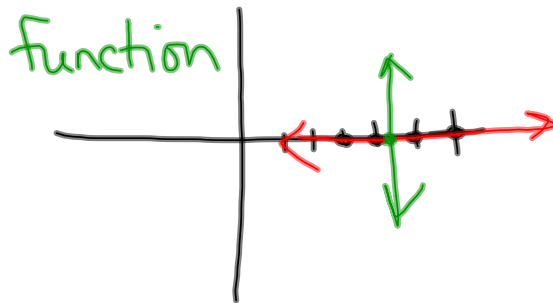
Discrete function
 • points not connected

Continuous function
 • one smooth or curved line
 • connected

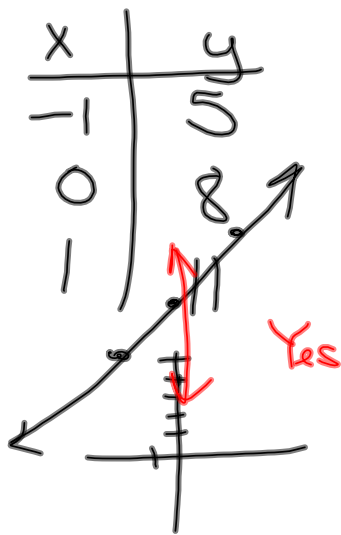
Vertical \updownarrow line test
 a vertical line cannot touch in more than one spot!



$(3, 0)$ $(4, 0)$ $(5, 0)$ $(6, 0)$



$$-3x + y = 8$$



$$\begin{aligned} -3(-1) + y &= 8 \\ 3 + y &= 8 \\ y &= 5 \end{aligned}$$

$$4x = 8$$

$x=2$ NO Y
No relationship
Not a function

$$4x = y + 8$$

1. make a table
2. solve for y
3. use a vertical line test

x	y
-1	-12

$$\begin{aligned}4(-1) &= y + 8 \\-4 &= y + 8 \\+4 & \quad +4 \\ \hline 0 &= y + 12 \\-y &= -12 \\y &= -12\end{aligned}$$

$$y = 3x - 8$$

function notation

$$\begin{array}{l} y \\ \text{range} \\ \text{output} \end{array} f(x) = 3x - 8$$

$$f(x) = -4x + 7$$

$$a) f(2) = -4(2) + 7$$

$$f(2) = -1 \quad \begin{array}{l} -8 + 7 \\ \text{(-1)} \end{array}$$

$$f(-3) + 1 \quad f(x) = -4x + 7$$

$$-4(-3) + 7 + 1$$

$$12 + 8$$

$$(20)$$

4D.)

$$f(x) = 2(x) - 3$$

$$f(-1) + f(2)$$

$$2(-1) - 3 + 2(2) - 3$$

$$-2 - 3 + 4 - 3$$

$$-5 + 1$$

$$-4$$

$$f(t) = 2t^3$$

$$\begin{aligned} 5a.) \quad f(4) &= 2(4^3) \\ &= 2(64) \\ &= 128 \end{aligned}$$

$$f(t) = 2t^{\boxed{3}}$$

$$5b.) \quad 3 \sqrt{\textcircled{f(t)} + 2}$$

distribute:

$$\begin{aligned} 3 \sqrt{\textcircled{f(t)}^{\boxed{3}} + 2} \\ 6t^3 + 2 \end{aligned}$$

5c.)

$$f(t) = 2t^3$$
$$f(-5) = 2(-5)^3$$
$$2(-125)$$
$$\textcircled{-250}$$

5d.)

$$f(t) = 2t^3$$

$$f(-3) - f(1)$$

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

$$2(-27) - 2$$

$$-54 - 2$$

$$-56$$

final
answerSubstitute
for first
part of
functionSubstitute for second
part of functionperform the indicated
operation for the
two different parts.