

Unit 3 - Day 1: Function Notation

Key

☑ Target: Recognize function notation, inputs, and outputs

Evaluate: $y = 2x + 5$ when $x = 3$

$$y = 2(3) + 5$$

$$y = 6 + 5$$

$$y = 11$$

Evaluate: $y = x^2 - 9$ when $x = -4$

$$y = (-4)^2 - 9$$

$$y = 16 - 9 = 7$$

Evaluate: $f(x) = 2x + 5$ when $x = 3$

$$f(3) = 2(3) + 5$$

$$f(3) = 6 + 5$$

$$f(3) = 11$$

Evaluate: $h(x) = x^2 - 9$ when $x = -4$

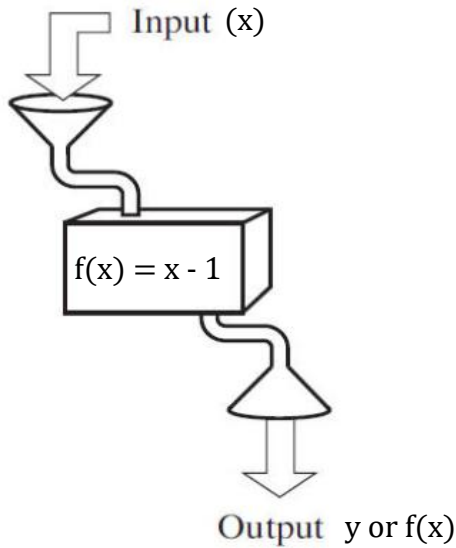
$$h(-4) = (-4)^2 - 9$$

$$h(-4) = 7$$

We usually call the x values: inputs or domain

We usually call the y or $f(x)$ values: outputs or range

Sometimes it helps to picture a function as follows:



x	f(x)
-2	-3
-1	-2
0	-1
1	0
2	1

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

$$= -3$$

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

$$= -2$$

$$f(0) = 0 - 1$$

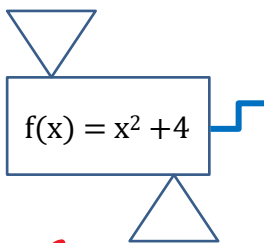
$$= -1$$

$$f(1) = 1 - 1 = 0$$

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

Given the following inputs, find the output:

Ex. 1 $x = -3$

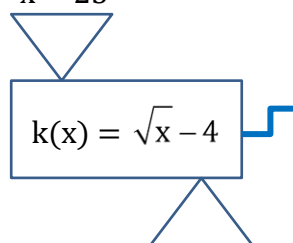


$$f(-3) = (-3)^2 + 4$$

$$= 9 + 4$$

$$= 13$$

Ex. 2 $x = 25$

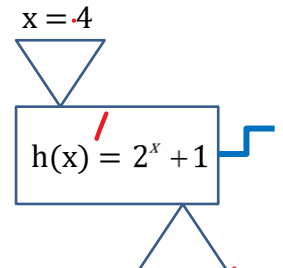


$$k(25) = \sqrt{25} - 4$$

$$= 5 - 4$$

$$= 1$$

Ex. 3



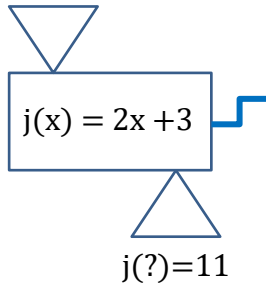
$$h(4) = 2^4 + 1$$

$$= 16 + 1$$

$$= 17$$

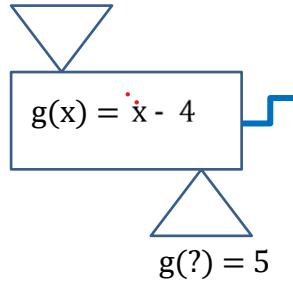
Given the following outputs, find the input(s): **★ Solve for x ★**

Ex. 4



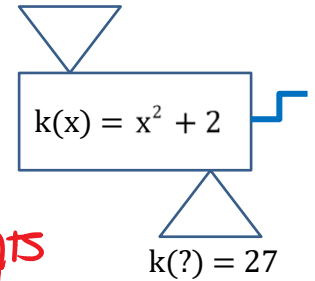
$$\begin{array}{r} 2x + 3 = 11 \\ -3 \quad -3 \\ \hline 2x = 8 \\ \frac{2x}{2} = \frac{8}{2} \\ \boxed{x = 4} \end{array}$$

Ex. 5



$$\begin{array}{r} 5 = x - 4 \\ 9 = x \\ \boxed{x = 9} \end{array}$$

** Ex. 6



students would only guess & check

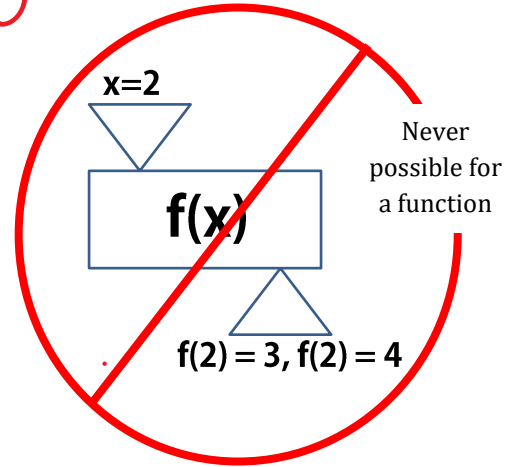
$$\begin{array}{r} x^2 + 2 = 27 \\ x = 5 \\ x = -5 \end{array}$$

Reflect on Examples #1-6

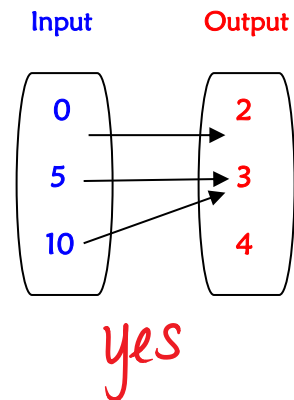
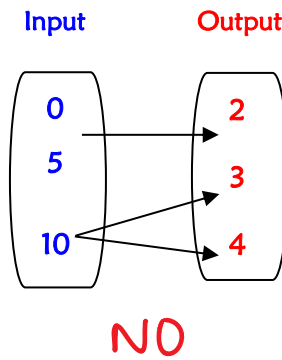
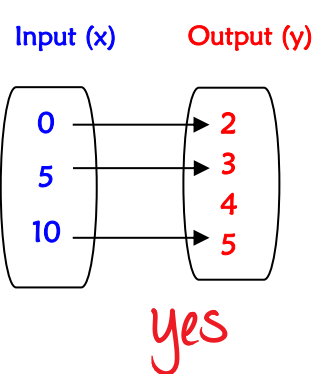
Can an input have more than one output? NO

Can an output have more than one input? yes

For a function we say: For every x there is exactly one y.



Which of the following mappings represent functions?



Which of the following tables represent functions?

Input	Output
1	5
2	6
2	7
3	8

no

Input	Output
1	4
2	8
3	12
4	16

yes

Input	Output
1	4
2	8
3	12
4	12

yes