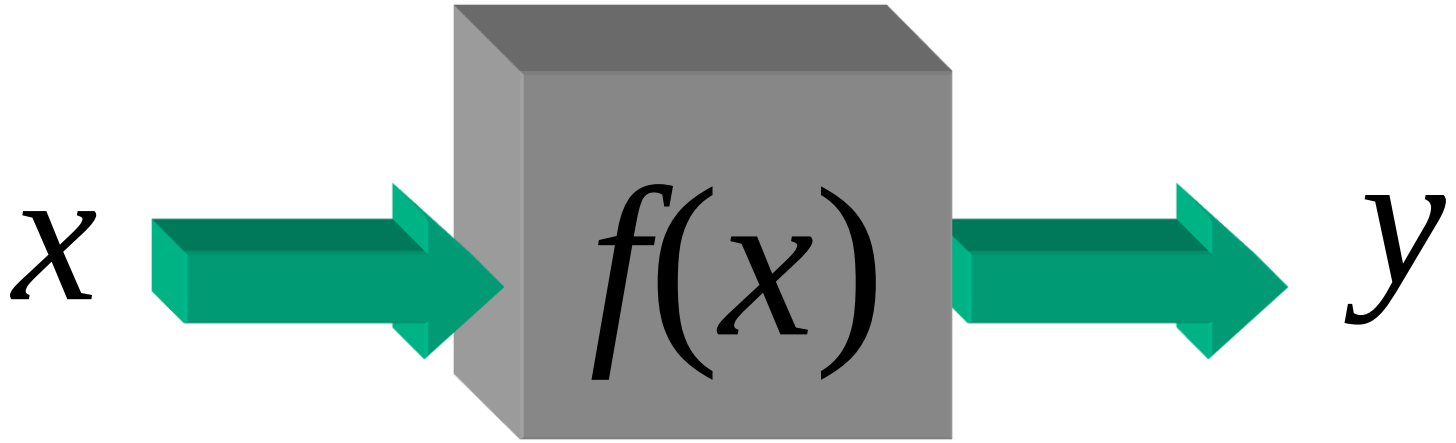
Let’s start things off with a little song…

https://www.youtube.com/watch?v=sE4eq0cjLFk

Functions

A **function** is a relation in which each element of the domain is paired with *exactly one* element of the range. Another way of saying it is that there is one and only one output (y) with each input (x).



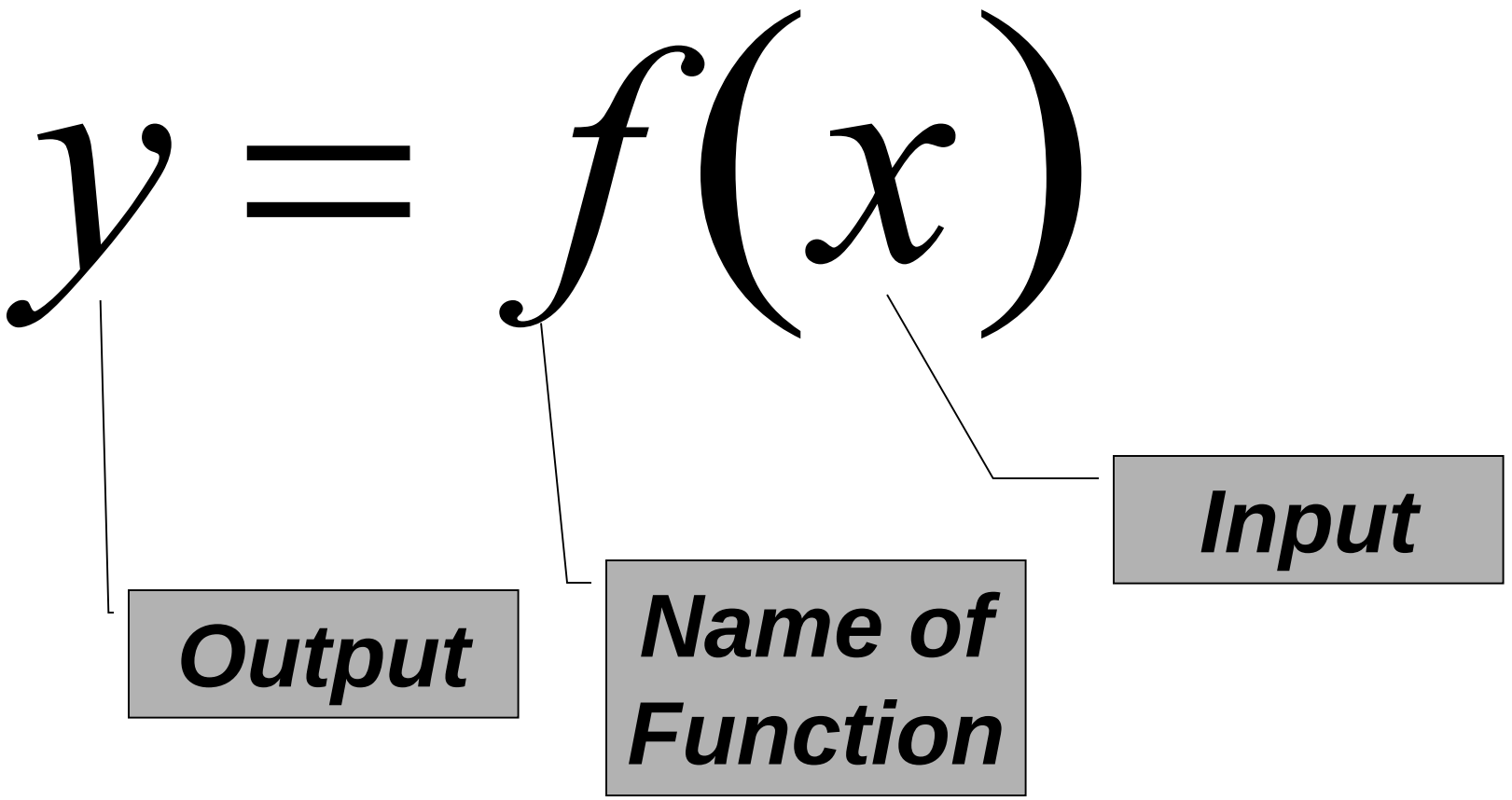
Functions

Function - for every x there is exactly one y.

Domain - set of x-values

Range - set of y-values

Function Notation



Which of the following relations are functions?

R= {(9,10, (-5, -2), (2, -1), (3, -9)}

S= {(6, a), (8, f), (6, b), (-2, p)}

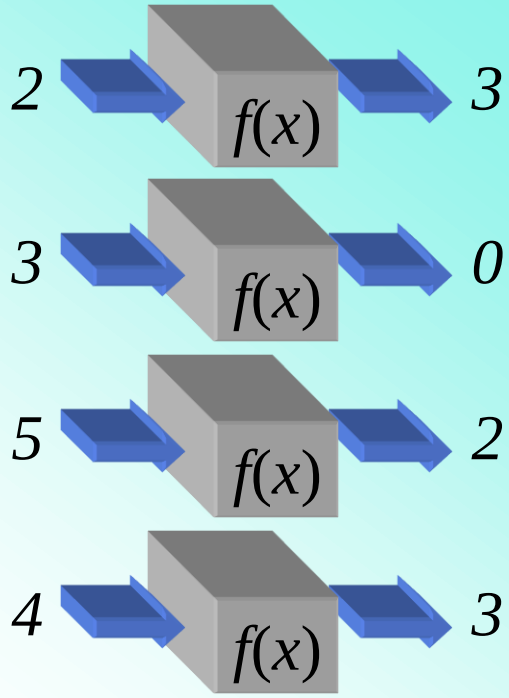
T= {(z, 7), (y, -5), (r, 7) (z, 0), (k, 0)}

No two ordered pairs can have the same first coordinate

(and different second coordinates).

Determine whether each relation is a function.

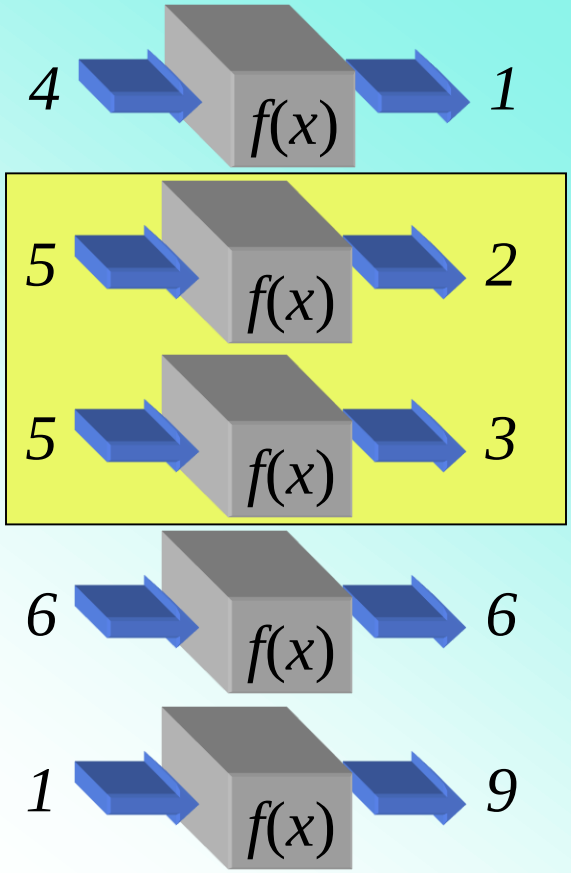
1. $\{(2, 3), (3, 0), (5, 2), (4, 3)\}$



YES, every domain is different!

Determine whether the relation is a function.

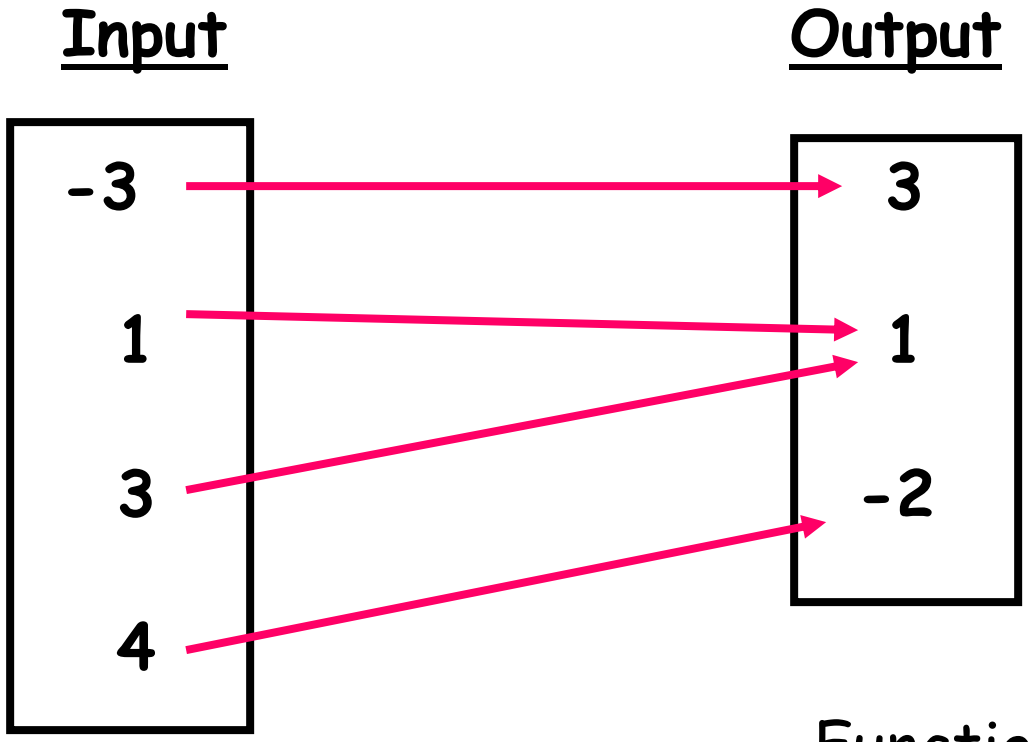
2. {(4, 1), (5, 2), (5, 3), (6, 6), (1, 9)}



NO,

5 is paired with 2 numbers!

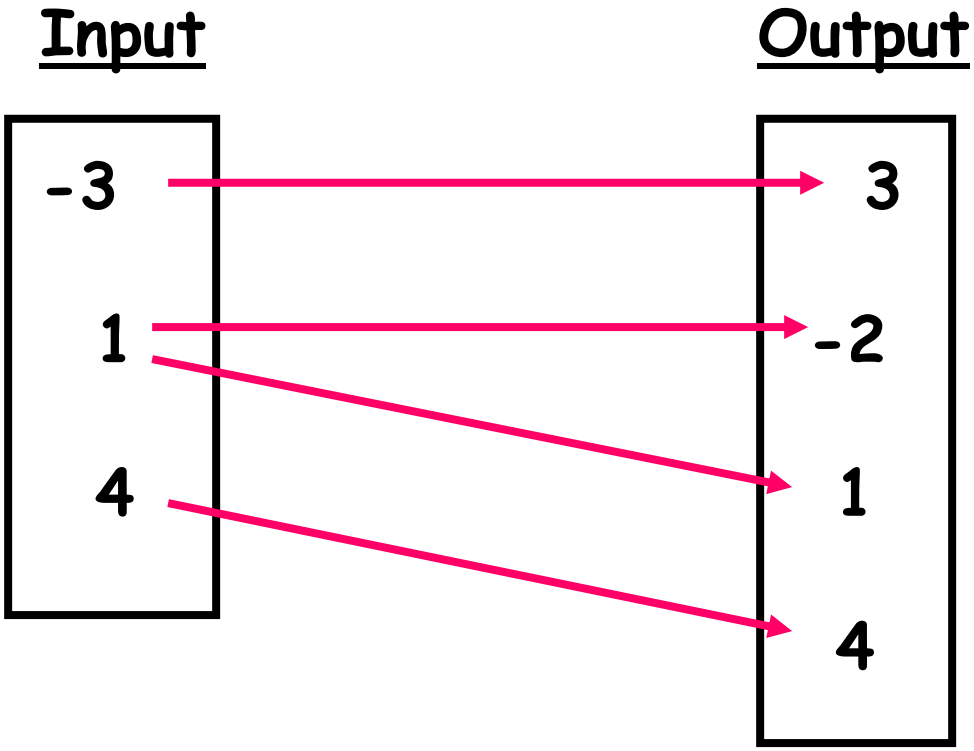
Identify the Domain and Range. Then tell if the relation is a function.



Domain = {-3, 1,3,4}
Range = {3,1,-2}

Function?
Yes: each input is mapped onto exactly one output

Identify the Domain and Range. Then tell if the relation is a function.



Domain = {-3, 1,4}
Range = {3,-2,1,4}

→ Notice the set notation!!!

Function?
No: input 1 is mapped onto Both -2 & 1

Is this relation a function?

{(1,3), (2,3), (3,3)}

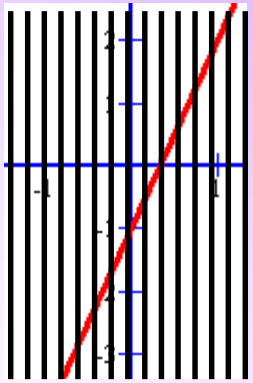
1. Yes
2. No

Answer Now

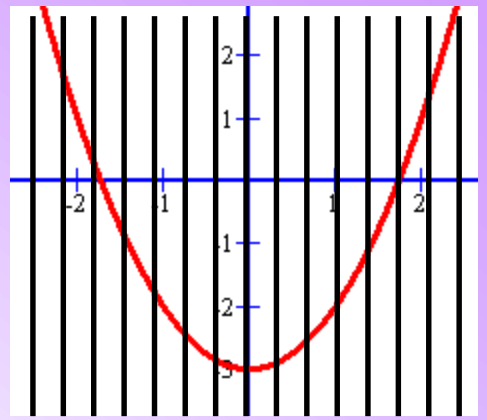
Vertical Line Test (pencil test)

If any vertical line passes through more than one point of the graph, then that relation is not a function.

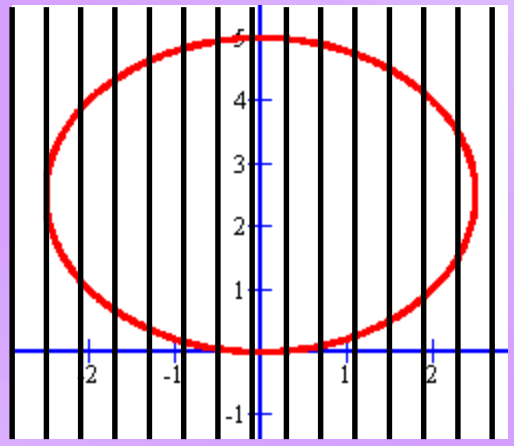
Are these functions?



FUNCTION!



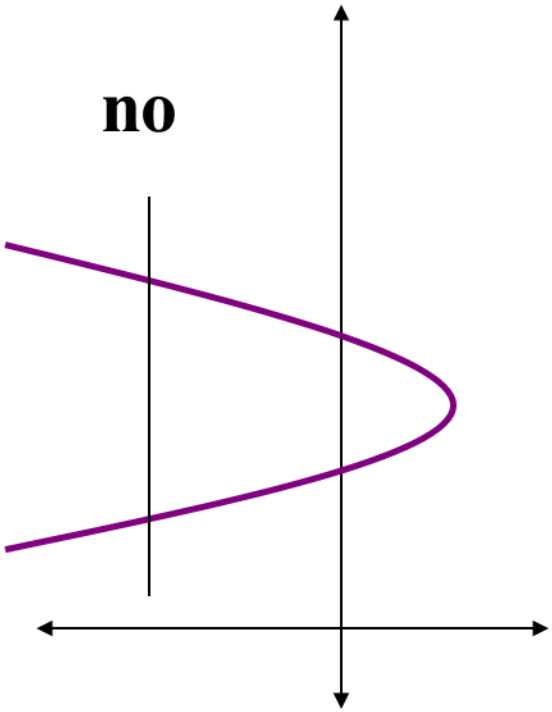
FUNCTION!

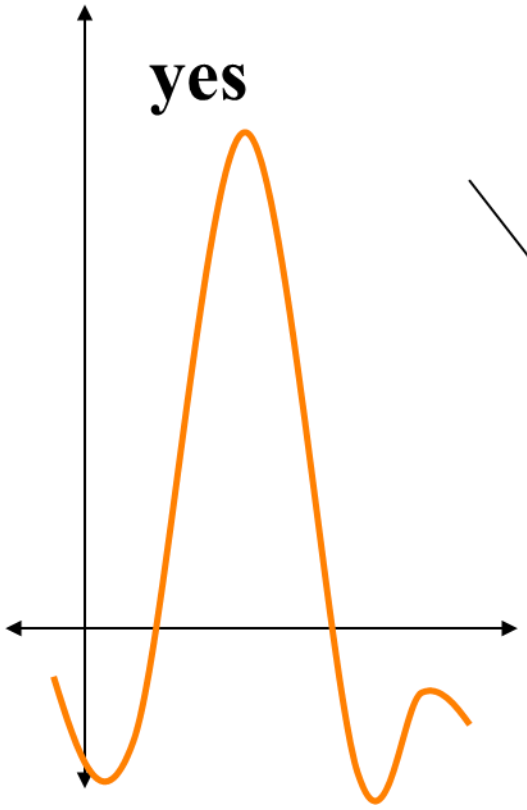


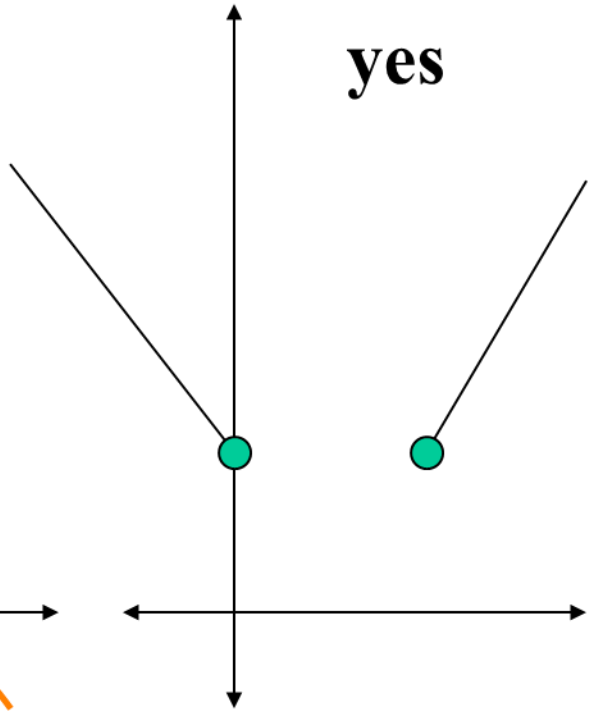
NOPE!

Vertical Line Test for Functions

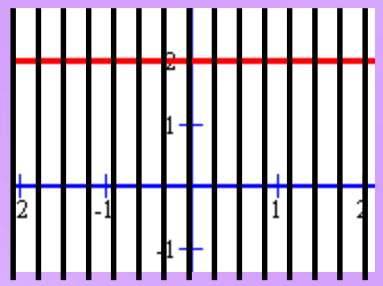
Do the graphs represent y as a function of x?



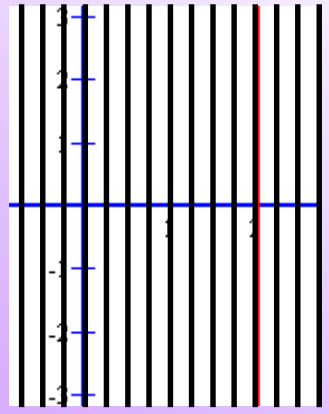




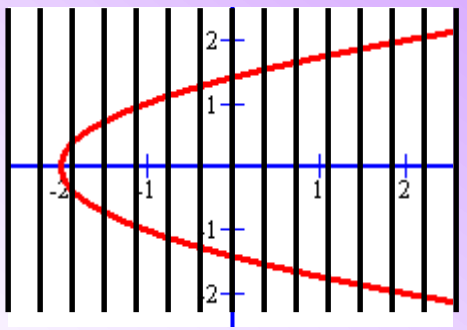
Vertical Line Test



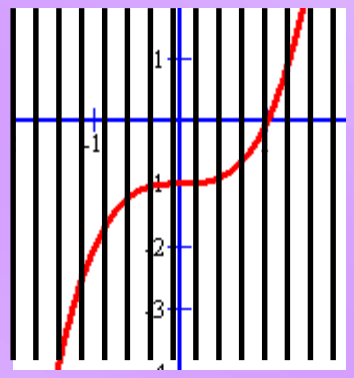
FUNCTION!



NO!

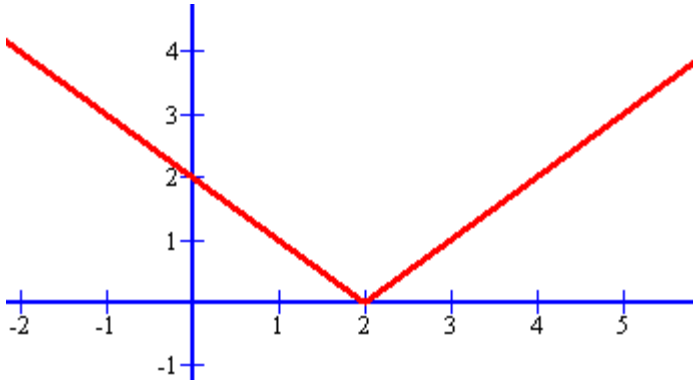


NO WAY!



FUNCTION!

Is this a graph of a function?

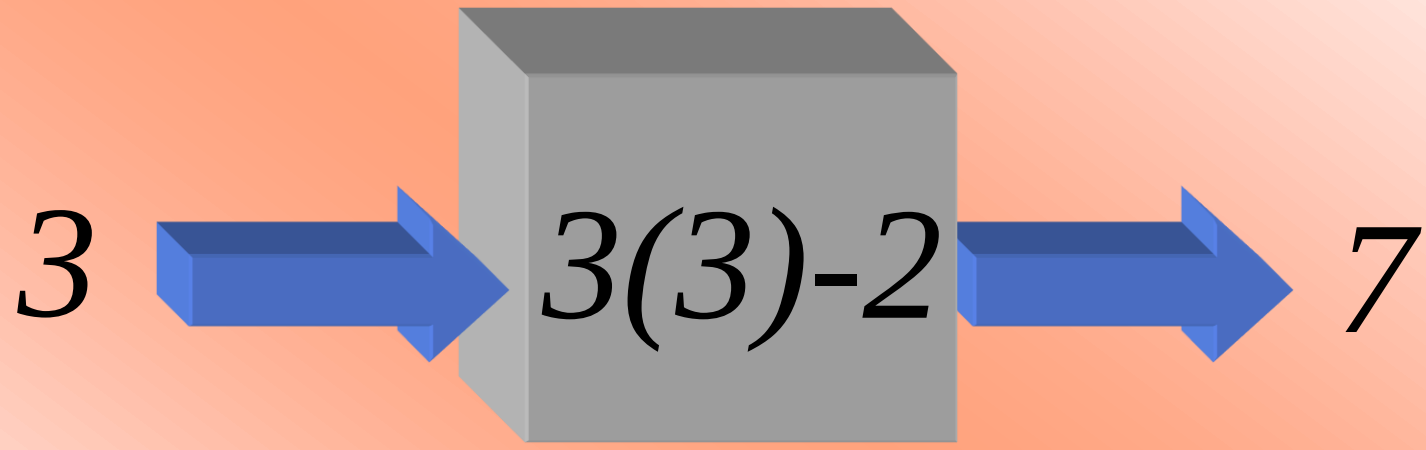


1. Yes
2. No

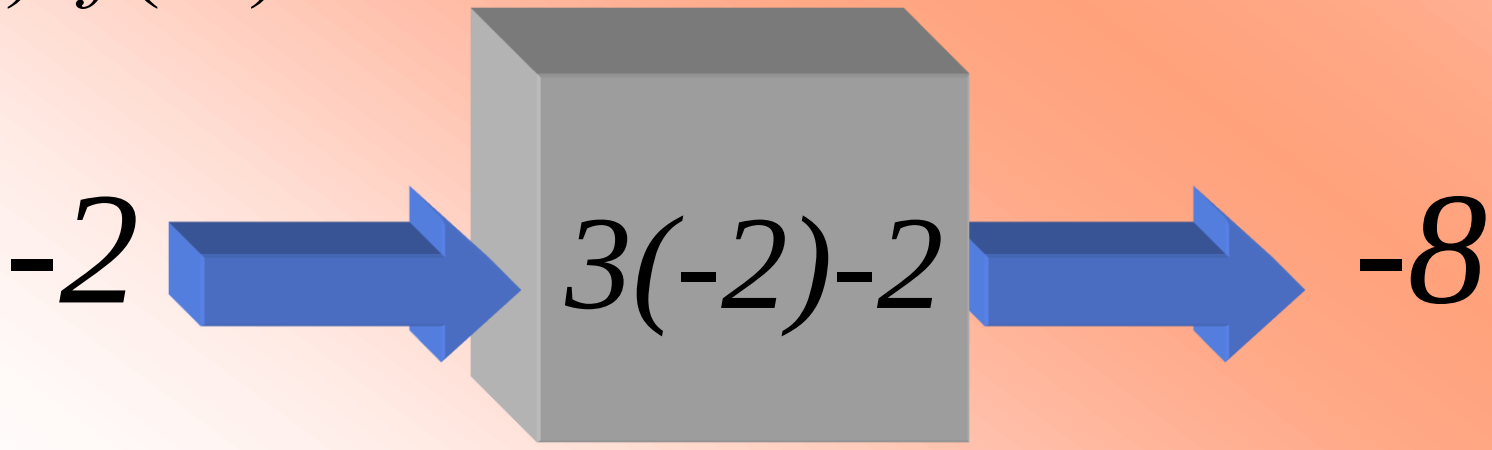
Answer Now

Given f(x) = 3x - 2, find:

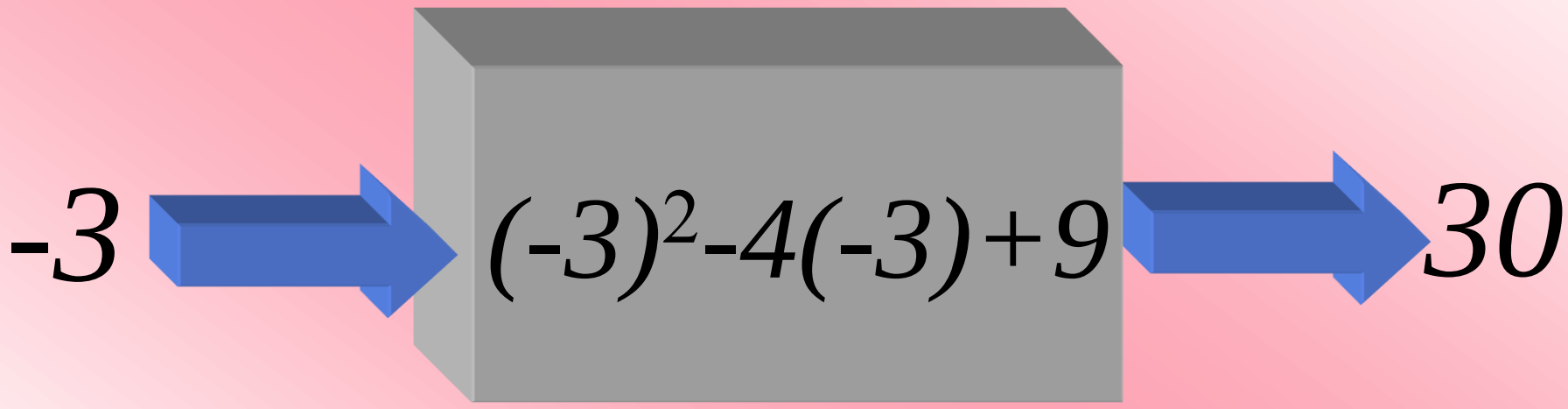
1) $f(3) = 7$



2) $f(-2) = -8$



Given $h(z) = z^2 - 4z + 9$, find $h(-3)$



$9 + 12 + 9$

$h(-3) = 30$

Given $g(x) = x^2 - 2$, find $g(4)$

1. 2
2. 6
3. 14
4. 18

Answer Now

Given $f(x) = 2x + 1$, find

$-4[f(3) - f(1)]$

1. -40
2. -16
3. -8
4. 4

Answer Now