3.1 Functions and Relations Guided Notes Name Key

Relation: A set of ordered pairs

Function: A relation in which every input has one output!

** $x = |y|$

Function or not a function?

Ex 1: Determine if each of the following represents a function.

1. $(0,3),(1,3),(5,4)(6,2)$ ← can be repeated outputs.

yes, every input has only one output!

2. $(2,4),(3,7),(4,4),(2,6)$

NO! $x=2$ has two outputs

3.

x	y
0	4
1	7
2	8
3	4
4	3

yes

4.

x	y
2	3
6	4
7	5
8	6
2	7

No!

5.

x	y
-3	2
4	2
6	2
7	2
12	2

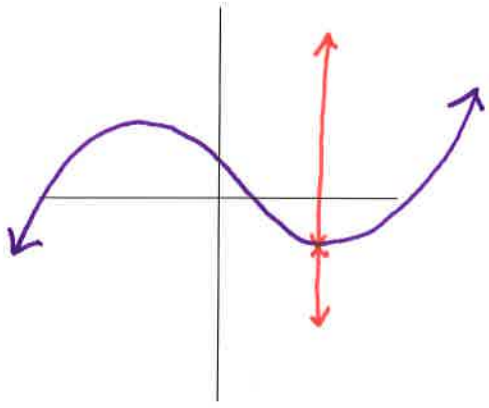
yes

Q: How do we determine if a graph represents a function?

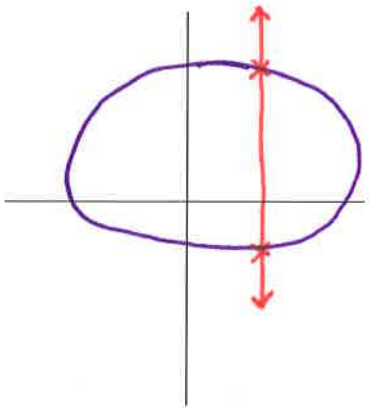
Vertical Line Test: A visual way to tell if a graph is a function

* if a vertical line passes through the line only <u>once</u> it is a function.

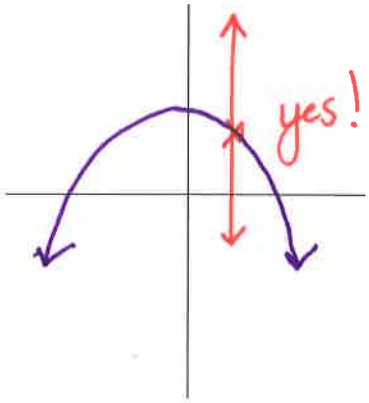
Ex 2: Determine if each graph represents a function.



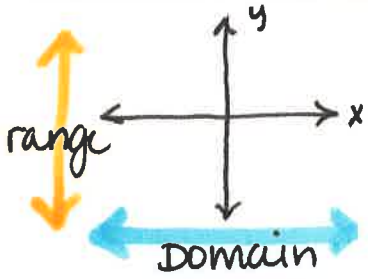
yes!



No!



Domain and Range



Domain: The set of all inputs (x-values)

Range: The set of all outputs (y-values)

Interval Notation: Way to express domain/range

ex]

Domain: $x \in [-3, 7)$ — "x is an element of" — first x-value — last x value

Range: $y \in (2, \infty)$ — "y is an element of" — first y-value — last y-value

DOMAIN: Left → Right

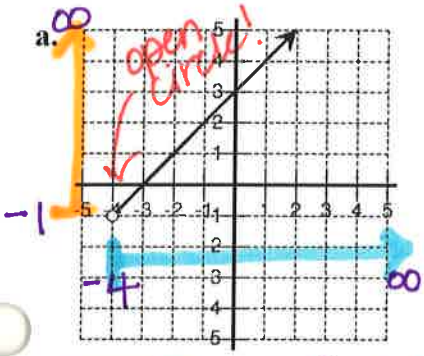
RANGE: Bottom → Top

[ ] Brackets mean included!

( ) Parenthasis mean excluded!

Ex 3: Determine if each relation is a function then state the domain and range using interval notation.

a.

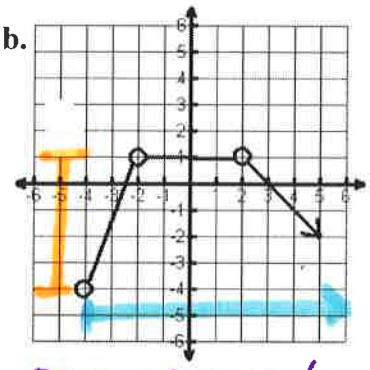


Domain: $x \in (-4, \infty)$

Range: $y \in (-1, \infty)$

Function: yes

b.

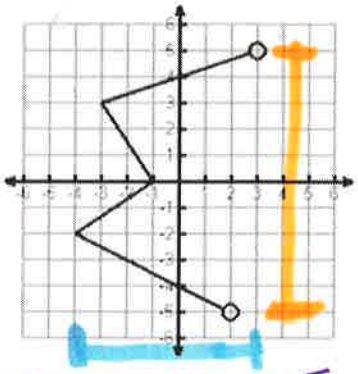


Domain: $x \in (-4, \infty)$

Range: $y \in (-4, 2)$

Function: yes

c.



Domain: $x \in [-4, 3)$

Range: $y \in (-5, 5)$

Discrete and Continuous Graphs

Discrete & Continuous Functions

Continuous Function: A function that includes all real #'s (Line)

Discrete Function: A function that only includes whole #'s & real #'s (dots)