total value of pile = $1.35

☆☆☆ # of nickels (is) 1 less than twice # of dimes

find # of nickels = y
# of dimes = x

$$\begin{cases} y = 2x - 1 \\ 5y + 10x = 135 \end{cases}$$

$5(y - 2x = -1)$

y = 13
x = 7

let x = 1st integer

y = 2nd integer

$-3(2x + 3y = 9)$

$2(3x + 2y = 1)$

$-6x - 9y = -27$

$6x + 4y = 2$

$-5y = -25$

$3x + 10 = 1$

$3x = -9$

$y = 5$

$x = -3$

Quiz #6

E.Q.:

Why is the concept of a function important and how do I use function notation to show a variety of situations modeled by functions?

How do I interpret functions that arise in applications in terms of context?

How do I use different representations to analyze linear functions?

How do I build a linear function that models a relationship between two quantities?

How do I interpret expressions for functions in terms of the situation they model?

How do I interpret key features of graphs in context?

What is a function?

- An activity or purpose natural to or intended for a person or thing

- Work or operate in a proper or particular way

- A relationship or expression involving one or more variables.

Functions

Function --- a relation in which each element of the *domain* is paired with *exactly one* element of the range.

There is **one and only one output** (y) with each input (x).

Vocabulary Recall

- **Domain** --- in a set of ordered pairs, (x, y), the *domain* is the set of all x-coordinates; also called "input"

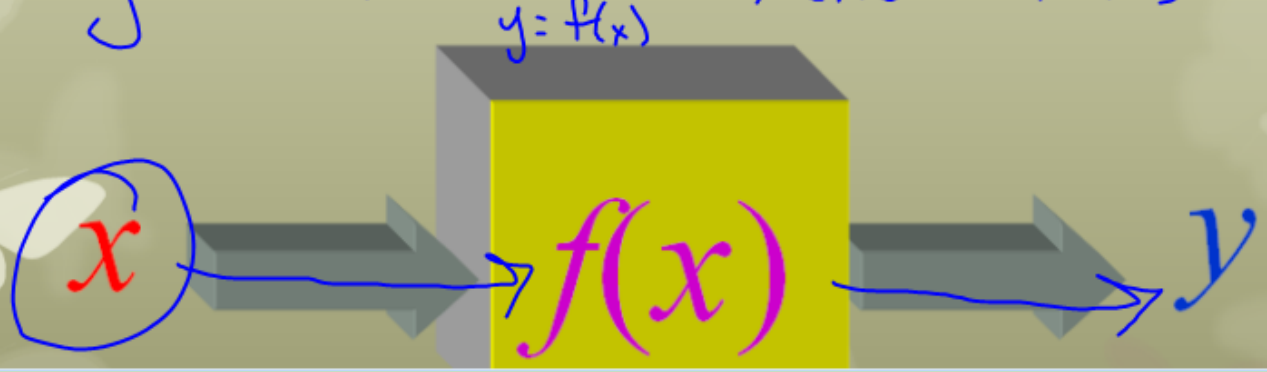
- **Range** --- in a set of ordered pairs, (x, y), the *range* is the set of all y-coordinates; also called the "output"

VOCABULARY RECALL

Function --- each element of the ***domain*** is paired with ***exactly one*** element of the ***range***.

"**Machine**" uses "input" to give "output"

$y = 2x + 3$ $\quad f(x) = 2x + 3$



f of x

Given the following set of ordered pairs, find the domain and range.

Ex 1: {(2,3),(-1,0),(4,-5),(0,-3)}

Finite Points

Domain

{-1, 0, 2, 4}

Range

{-5, -3, 0, 3}

Given the following set of ordered pairs, find the domain and range.

Ex 2: {(-2,4),(1,2),(4,3),(0,2)}

(1,3)

D:

{-2, 0, 1, 4}

R:

{2, 3, 4}

Determine whether each relation is a function. Explain.

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

2. {(4, 1), (5, 2), (5, 3), (6, 0), (1, 9)} No

3. {(1,-4), (2,3), (-5,3)} Yes

Here are other ways to represent relations. Determine if these relations are functions.

We can represent functions with:

- tables
- mapping diagrams
- graphs

Table

1.

x	-3	-2	-1	0	1	2	3
y	1	-2	2	4	-3	-2	-1

Yes

2.

Animal	Average Lifetime (years)	Maximum Lifetime (years)
Cat	12	28
Cow	15	30
Deer	8	20
Dog	12	20
Horse	20	50

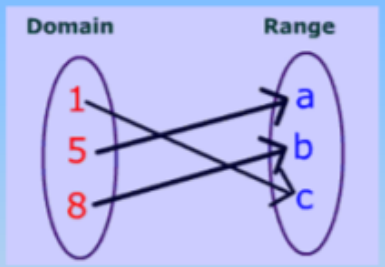
No

x y

Determine if these relations are functions.

Mapping

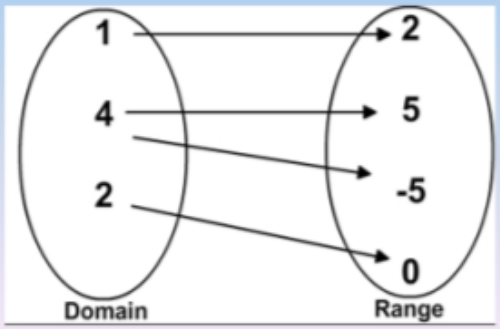
1.



(1,c)
(5,a)
(8,b)

Yes

2.



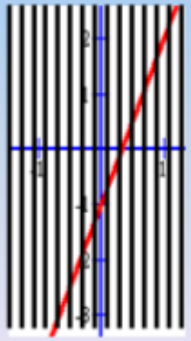
(1,2)
(4,5)
(4,-5)
(2,0)

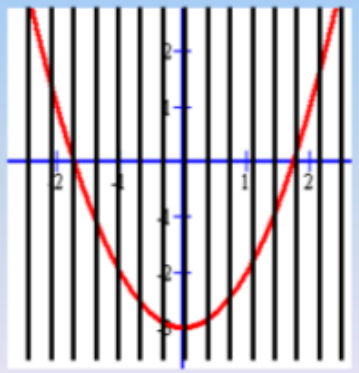
No

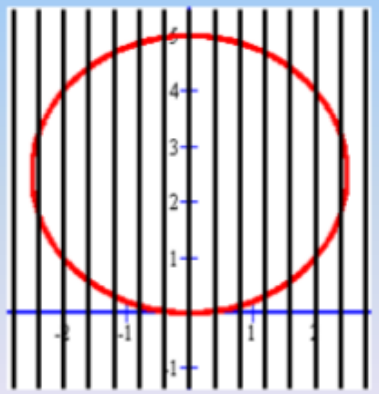
Vertical Line Test (VLT)

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

Are these relations functions?

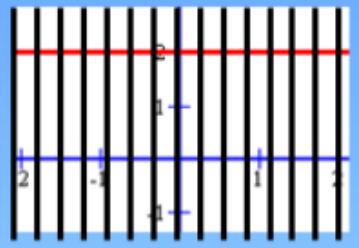




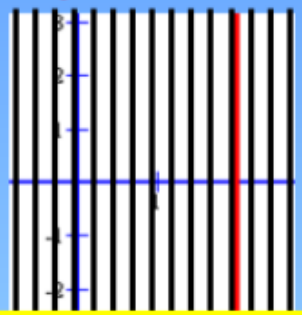


Determine if these relations are functions. Explain.

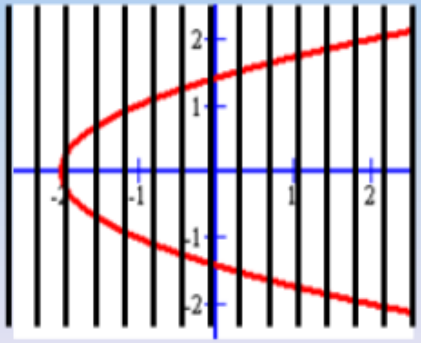
1.



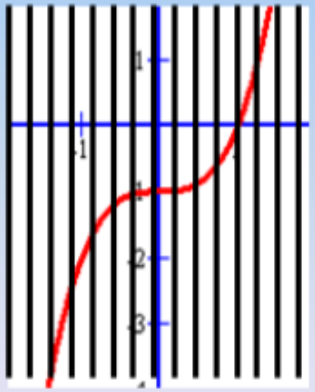
2.



3.



4.



Stating the domain and range of a function

New Notation for Graphing on Number Lines:

- **Parentheses:**
  endpoint not included <, >
- **Bracket:**
  endpoint included ≤, ≥

Writing Interval Notation from Graphs

Interval always written from smallest number to largest number

[(smallest #, largest #)]

Infinity: **always** use a **parenthesis**

Infinite Points

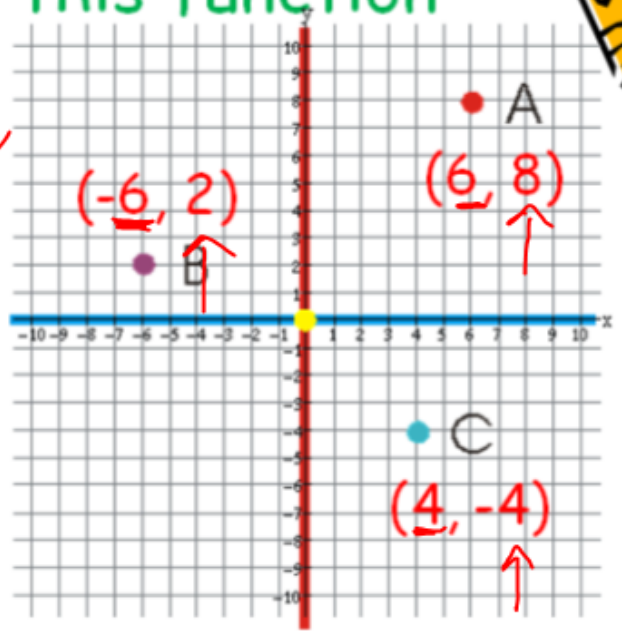
RECALL: State the Domain and Range of this function

Domain:

{-6, 4, 6}

Range:

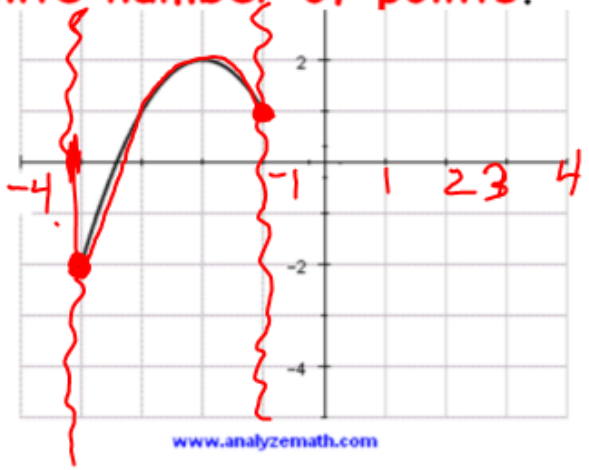
{-4, 2, 8}



Finite Set

Sometimes the set of ordered pairs from a graph may be an infinite number of points.

Ex 1



State the Domain and Range from a Continuous Graph

Domain: Identify Far Left Point

Domain: Identify Far Right Point

Domain: Write the x-coordinates from smallest to largest.

Inequality Notation:

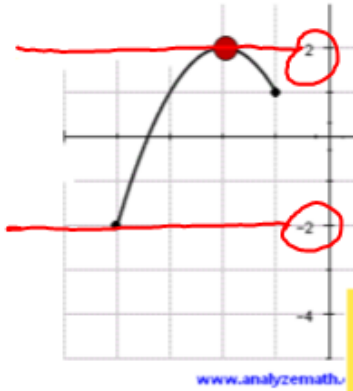
D: $-4 \leq x \leq -1$

Interval Notation:

D: $[-4, -1]$

State the Domain and Range from a Continuous Graph

Range: Identify **Maximum** Point



Range: Identify **Minimum** Point

Range: Write the y-coordinates from smallest to largest

Inequality Notation:

$-2 \leq y \leq 2$

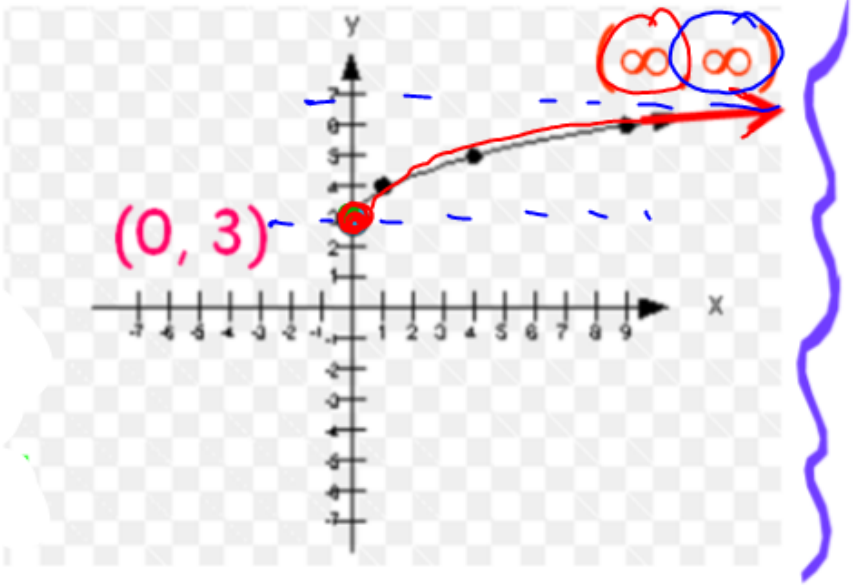
Interval Notation:

$[-2, 2]$

State the Domain and Range from a Continuous Graph

Ex 2

Domain: $[0, \infty)$



Range: $[3, \infty)$

State the Domain and Range

[redacted]ntinuous Graph

E[redacted]

Domain:

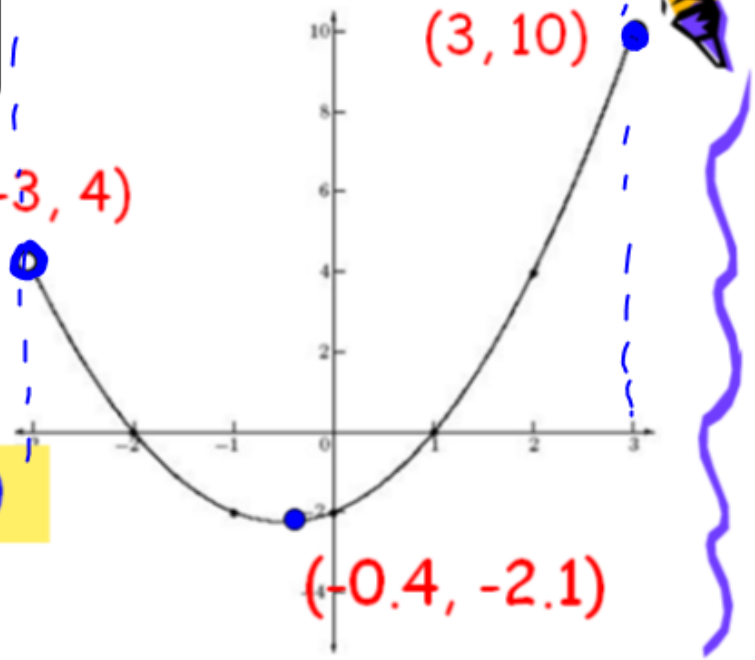
$-3 < x \leq 3$

$(-3, 3]$

Range:

$-2.1 \leq y \leq 10$

$[-2.1, 10]$



[redacted]

D

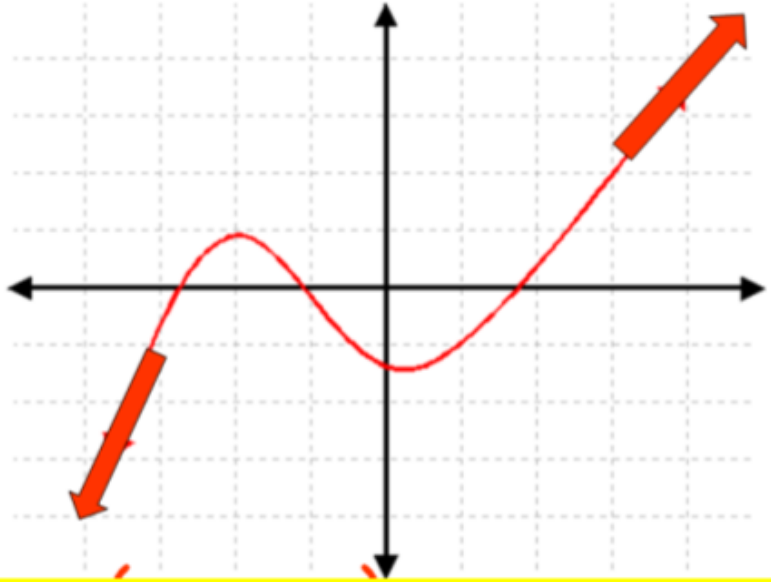
$(-3, 3]$

R

$[-2.1, 10]$

State the Domain and Range from a Continuous Graph

Ex 4

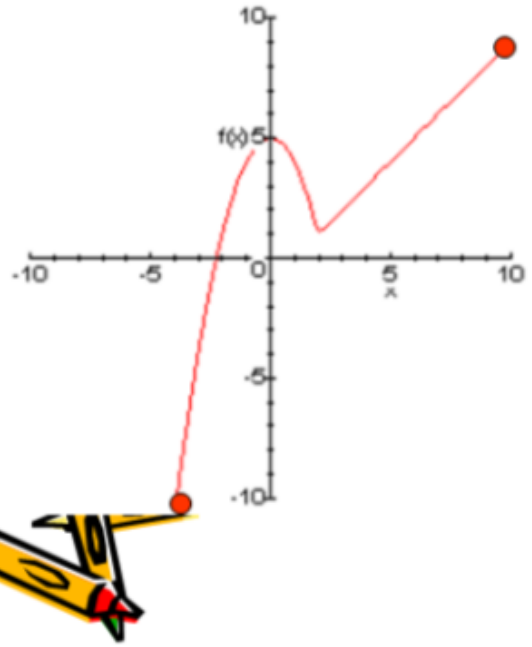


Domain:

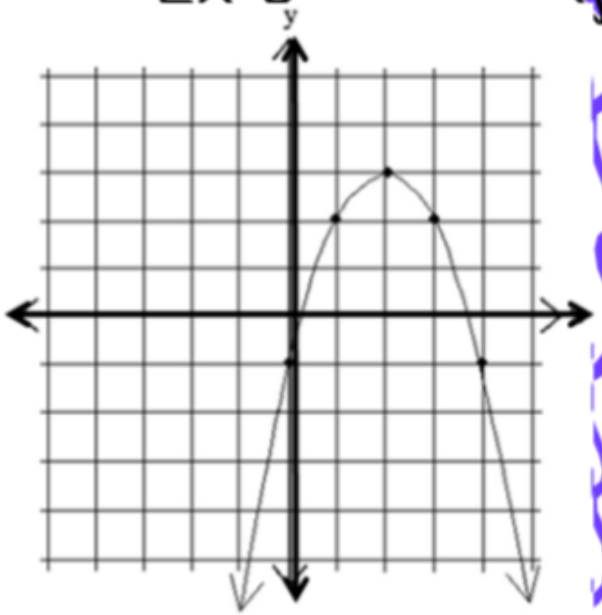
Range:

Try These on Your Own:

Ex 5



Ex 6



Worksheet
State Domain and Range Of Functions

10 minutes