What is Function Notation?

- Another way to write $y=$
- Instead of writing $y = x^2 + 1$

  Function Notation writes it as: $f(x) = x^2 + 1$
- How do you say "f(x)"? "f of x"
- f is the function name
- x is the independent variable (domain)

Given $f(x) = 3x + 1$

1. Find f(-2) $= 3(-2) + 1 = -6 + 1 = -5$

   $f(-2) = -5$
2. Find x when f(x)=34

$34 = 3x + 1$

$-1 \quad -1$

$\frac{33}{3} = \frac{3x}{3}$

$x = 11$

Sec 2-1: Relations and Functions

Relation

A set of ordered pairs

(a bunch of points)

Function

A kind of relation where each x is paired with one and only one y.

Each input produces only one output

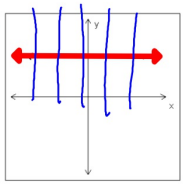
Which of the following is correct?

1. Every Relation is a Function
2. Every Function is a Relation

This is similar to saying that All Squares are Rectangles!

Is each a function:

a.



YES

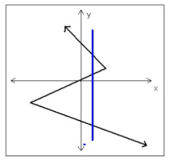
No vertical line will touch this graph more than once.

What is the Vertical Line Test?

A test to see if a graph represents a function

If any vertical line intersects a graph more than once the graph is NOT a function.

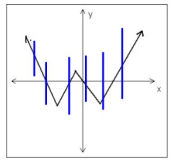
b.



NO

A vertical line can touch the graph more than once.

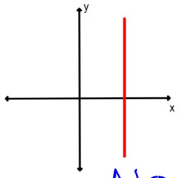
c.



Yes

No vertical line touches the graph more than once.

d.

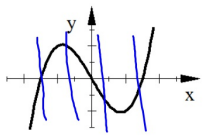


NO

A vertical line will touch the graph infinitely many times

Tell if each of the following is a Function or Not a Function.

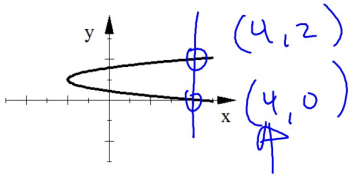
c)



Yes

No vertical line touches the graph more than once.

d)



NO

There is at least one vertical line that touches the graph more than once.

2. Tell if each of the following is a Function or Not a Function.

a) $(4,3),(3,-9),(6,1),(-6,3)$

Yes All x values are different

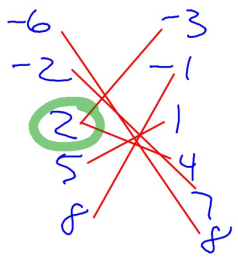
b) $(-5,-2),(11,-1),(-5,6),(8,4)$

No The x value -5 is repeated. This means the input of -5 is paired with two different output values.

Mapping Diagram (5,1), (-2, 7), (2, -3), (8, -1), (2, 4), (-6, 8)

1. List the Domain and Range
2. Connect each member of the Domain with its corresponding value in the Range.

Domain: Range:



Is this Relation a function? NO

the Domain value of 2 is paired with two different Range Values

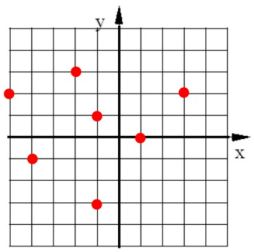
If any domain value has more than one line coming from it then the relation is NOT a function

Domain:
- x-coordinates
- Input
- Independent Variable

Range:
- y-coordinates
- Output
- Dependent Variable

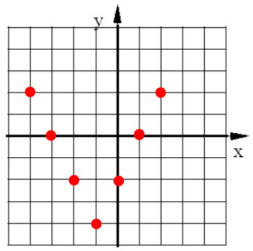
These are called Discrete Graphs.

The domain and range can just be listed using all the values of x and y.



Domain: {-5,-4,-3,-1,1,3}

Range: {-3,-1,0,1,2,3}



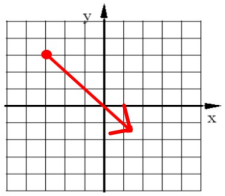
Domain: {-4,-3,-2,-1,0,1,2}

Range: {-4,-2,0,2}

Discrete Quantity
a quantity that can be counted

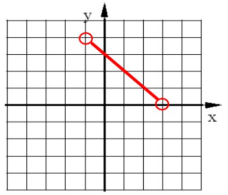
These are called Continuous Graphs.

The domain and range can't be listed using all the values of x and y because there are an infinite # of points. You must use INEQUALITIES



Domain: $x \geq -3$

Range: $y \leq 3$



Domain: $-1 < x < 3$

Range: $0 < y < 4$

Continuous Quantity
Quantity that can't be counted, it has to be measured.

Given the function $g(x) = 3x^2 - 5$

Find the Range for this given domain: x = -2, 1, 2, 5

$g(-2) = 3(-2)^2 - 5 = 7$
$12 - 5$

$g(1) = 3(1)^2 - 5 = -2$
$3 - 5$

$g(2) = 3(2)^2 - 5 = 7$
$12 - 5$

$g(5) = 3(5)^2 - 5 = 70$
$75 - 5$

Range is the output:
$-2, 7, 70$

Hwk #6 Sec 2-1

Page 59 Due Monday

Problems 12, 13, 17, 18, 37-39, 46, 50, 51