9/10/2012 - Sec 3.5 Math 1010

#18
#21
#36

#18 $x + 2y > 0$

$-x \qquad -x$

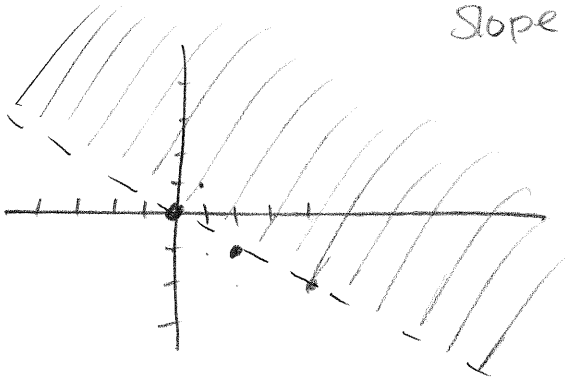
$\frac{2y}{2} > \frac{-x}{2}$

$y > -\frac{1}{2}x + 0$

Slope: $-\frac{1}{2}$ y-int: 0

$y = mx + b$

$y = -\frac{1}{2}x + 0$



$1 > -\frac{1}{2}(1)$

$1 > -\frac{1}{2}$ true

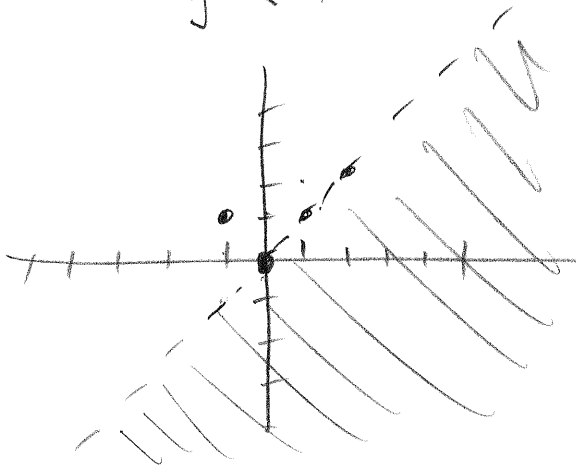
#21 $y < x$

$y = mx + b$

$y < 1x + 0$

$(-1, 1)$

$1 < -1$ false



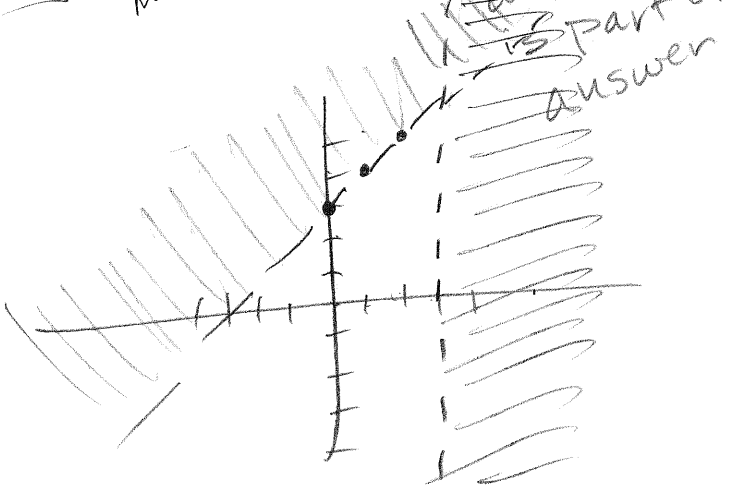
#36 $x + 3 < y$ or $x > 3$

$y > mx + 3$ (m=1, b=3)

union

any shade part of $x > 3$ answer

$0 > 3$ false



Sec 3.5 Intro to Relations and Functions

If the variable y depends on the variable x, then y is the dependent variable and x is the independent variable

y = cost of a tank of Gas ← dependent

x = # of gallons ← independent

A Relation is any set of ordered pairs creating a correspondence

Ex: $\{(5,40), (5,10), (20,20), (30,55)\}$

A function is a special kind of correspondence. it is a correspondence where for every input value there is exactly 1 output value

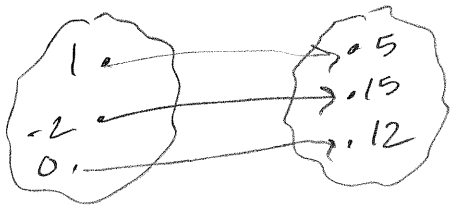
to be a function

1. every input there is an output
2. For each input exactly one output

Ex: Not a function $\{(5,40), (5,10), (20,20), (30,55)\}$

We can show our Relationships in a few ways

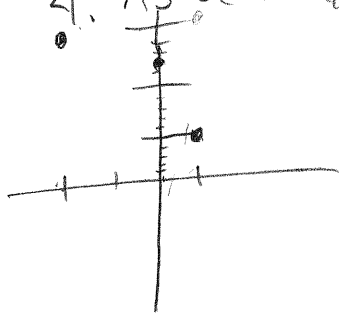
1. A set of ordered pairs
   Ex: $\{(1,5), (-2,15), (0,12)\}$
2. As a correspondance ("mapping")



3. As a table

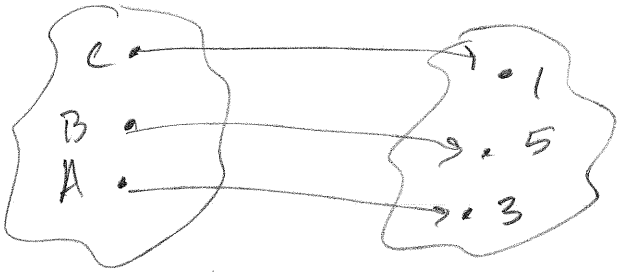
x	y
1	5
-2	15
0	12

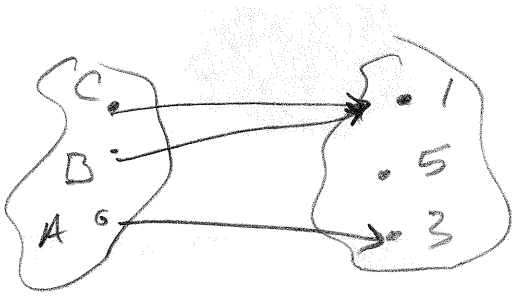
4. As a Graph



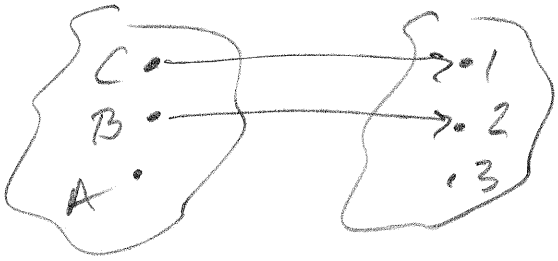
5. As an equation
   Ex: $y = x + 1$

Ex: of a function

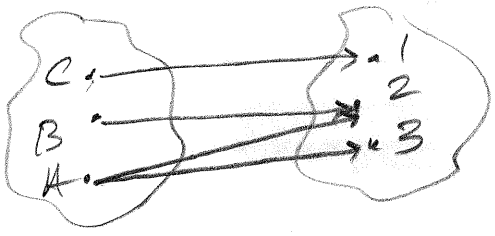




Ex of NOT functions



A doesn't have an output



2 sets involved in each correspondence

Inputs: Domain (x values)

Outputs: Range (y values)

Ex: $\{(1,4),(1,5),(2,6),(3,10)\}$

Domain: $\{1,2,3\}$

Range: $\{4,5,6,10\}$

Is it a function: No

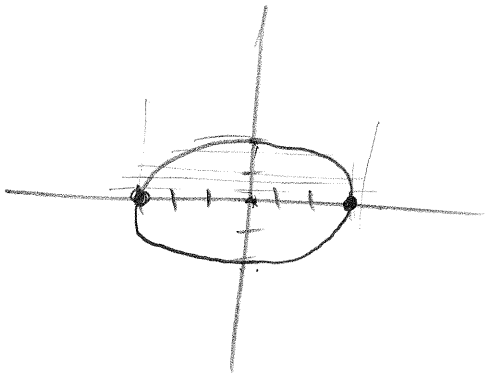
x	y
-1	4
0	10
1	4

Domain: $\{-1,0,1\}$

Range: $\{4,10\}$

function?: yes

A graph is a good way to visualize a Relation



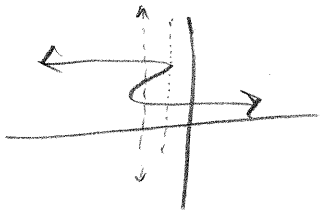
Domain: $[-3, 3]$

Range: $[-2, 2]$

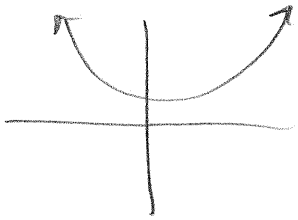
function: No

Vertical Line Test: If every vertical line intersects the graph in no more than one point, then the Relation is a function.

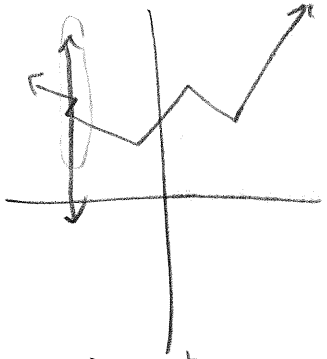
function?



Not



function



Not

function given as equation:

If no domain is specified the domain is assumed to be all Real Numbers that produce a Real Number

Exclude from the domain

- the x-values that make denominator 0
- the x-values that make a negative under an even Root

Ex: $y = \frac{5}{x-1}$ ←

D: $x \neq 1$

or

$(-\infty, 1) \cup (1, \infty)$

, $y = \sqrt{2x-1}$

$2x - 1 \geq 0$

$+1 \quad +1$

$\frac{2x}{2} \geq \frac{1}{2}$

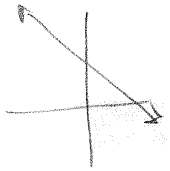
D: $x \geq \frac{1}{2}$

or

$[\frac{1}{2}, \infty)$

function? Domain?

$y = -2x + 7$



f: yes

D: $(-\infty, \infty)$

$y^4 = x$

f: NO

D: $[0, \infty)$

$x = 1, y = 1$

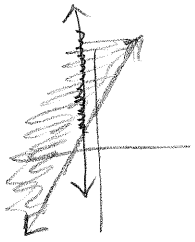
$x = 1, y = -1$

$(-1)(-1)(-1)(-1)$

$(+1)(+1)$

1

$y \geq 4x + 2$



function: NO

D: $(-\infty, \infty)$