MCF3M Unit 1, Lesson 3

Introduction to Functions

To define a function we must first start by defining a ***relation*** or ***relationship.***

*A **relation** is...* a set of ordered pairs.

A set of (input, output) values.

The first value (x) is called the independent variable and the second is the dependent variable

A relation can be defined using:

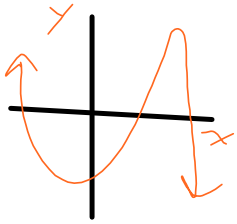
1) Set of ordered points

{(1,1) (2,3) (3,7)}

2) table

x	y
0	0
1	1
2	4
3	9
4	16

3) graph

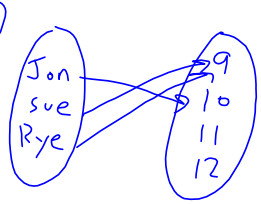


4) equation

$y = x^2$

$y = 3x - 1$

5) mapping diagram



So what is a **function**?

A function is a relationship such that every value of x (or the independent variable) only corresponds to one value of y. (or the dependent variable).

1. Which relations are functions?

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

yes

b)

Shoe Size	Height (cm)
8	158 cm
9	165 cm
10	170 cm
10	174 cm
11	183 cm

no

c) $y = x^2 - 4$

yes

(5, 21)
(2, 0)
(1, -3)

d) $y = 10x + 4$

yes

(0, 4)
(1, 14)

e) $y^2 = x$

no

(4, 2)
(4, -2)

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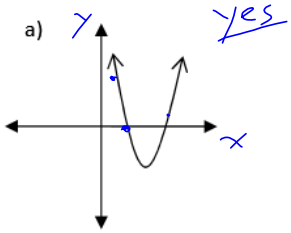
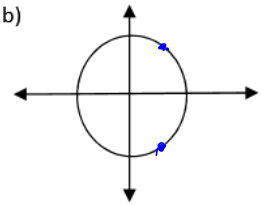
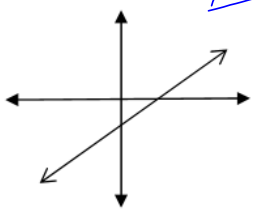
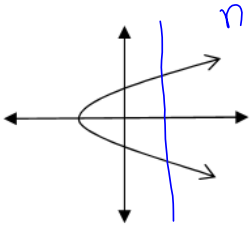
2. Examine the graphs below, which are functions?

a) 

yes

b) 
NO

c) 
yes

d) 
NO

We can use the **vertical line test** to determine whether a graph represents a function or not. (see page 8 of textbook)

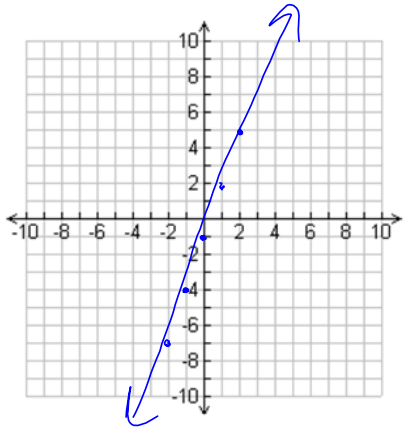
3. Graph each function below by completing a table of values.

$y = mx + b$

a) $y = 3x - 1$

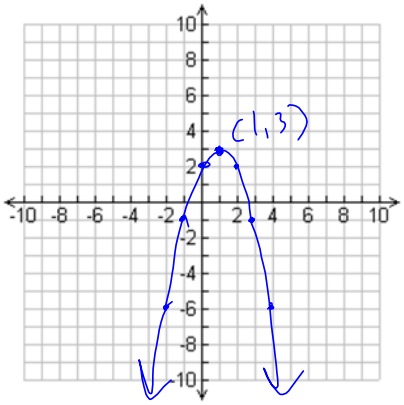
x	y
-2	-7
-1	-4
0	-1
1	2
2	5

$y = 3(-2) - 1$
$= -6 - 1$



b) $y = -x^2 + 2x + 2$

x	y
-3	-13
-2	-6
-1	-1
0	2
1	3
2	2
3	-1



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Text page 12 #1,3,5,7, 12 (just pick a couple players/teams from any sport you know, or make it up!)

Text page 5 #2, 3