Name: _____ Blk: _____ Date: _____

PreCalculus 12

1.1 Functions & Relations

A **relation** is a bunch of coords that may/may not form a line/curve.

The set of *x-values* of all the points is called the domain.

The set of *y-values* of all the points is called the range.

Example 1: Find the domain and range of

a)

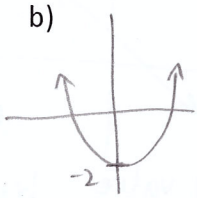
the set

D: $\{x \mid x \in -2, 1, 3\}$

R: $\{y \mid y \in -3, 0, 2\}$

belongs to "is"

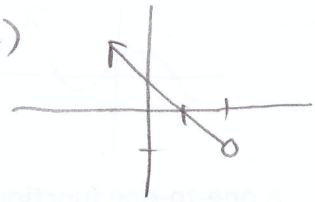
b)



D: $\{x \mid x \in \mathbb{R}\}$

R: $\{y \mid y \geq -2, y \in \mathbb{R}\}$

c)



D: $\{x \mid x < 2, x \in \mathbb{R}\}$

R: $\{y \mid y > -1, y \in \mathbb{R}\}$

When finding the domain and range, remember that the

1) denominator's expression cannot $= 0$

For example:

$y = \frac{1}{x+3} + 2$

D: $\{x \mid x \neq -3, x \in \mathbb{R}\}$

R: $\{y \mid y \neq 2, y \in \mathbb{R}\}$

TOV to get y-values

2) expression inside an even root cannot be negative (must be ≥ 0)

For example:

$y = -5 - \sqrt{x+4}$

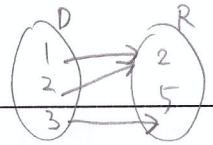
$x + 4 \geq 0$

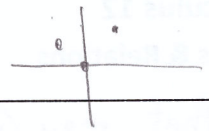
$x \geq -4$

D: $\{x \mid x \geq -4, x \in \mathbb{R}\}$

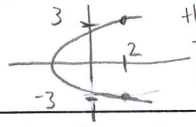
R: $\{y \mid y \leq -5, y \in \mathbb{R}\}$

A **function** is: For every x-value there's only 1 y-value





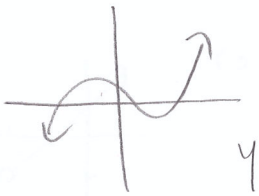
whereas

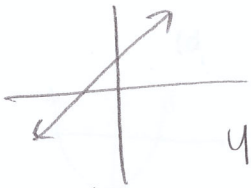


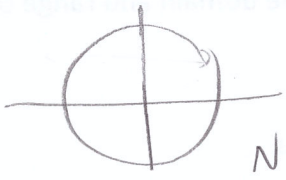
this x=2 yields two y-values, namely 3 and -3

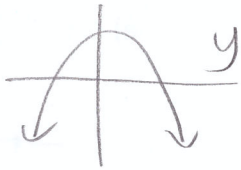
A function can be represented in mapping notation; coordinates; table of values, or as a graph.

From a graphical perspective, a relation is a function if it 'passes' the vertical line test. Every vertical line must intersect the graph only once.





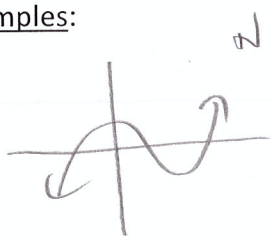


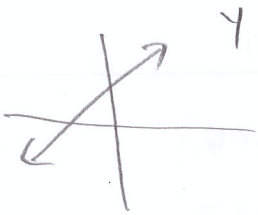


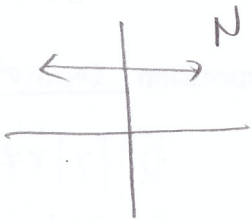
A **one-to-one function** has every y value with only 1 x-value

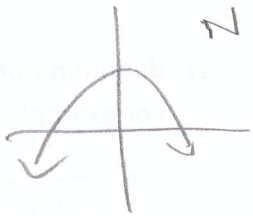
A function is a *one-to-one function* if it passes the horizontal line test. Every horizontal line must intersect the function only once.

Examples:

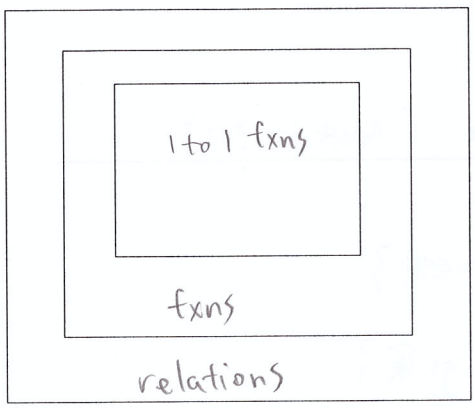








Hierarchy of stuffs:



HW: Section 1.1 #1-3 (only 3 questions!)