

Background work: p. 2 #1 – 8 (It is EXPECTED that you can do ALL of these with EASE!)  
(If stuck, see the appropriate appendix!)

**\*READ the "Invesgate " on pp. 4-5 #A - K**  
(I've done the scaer plots for you on the next slides.)

## Today's Learning Goal(s):

Date: \_\_\_\_\_  
(Every lesson)

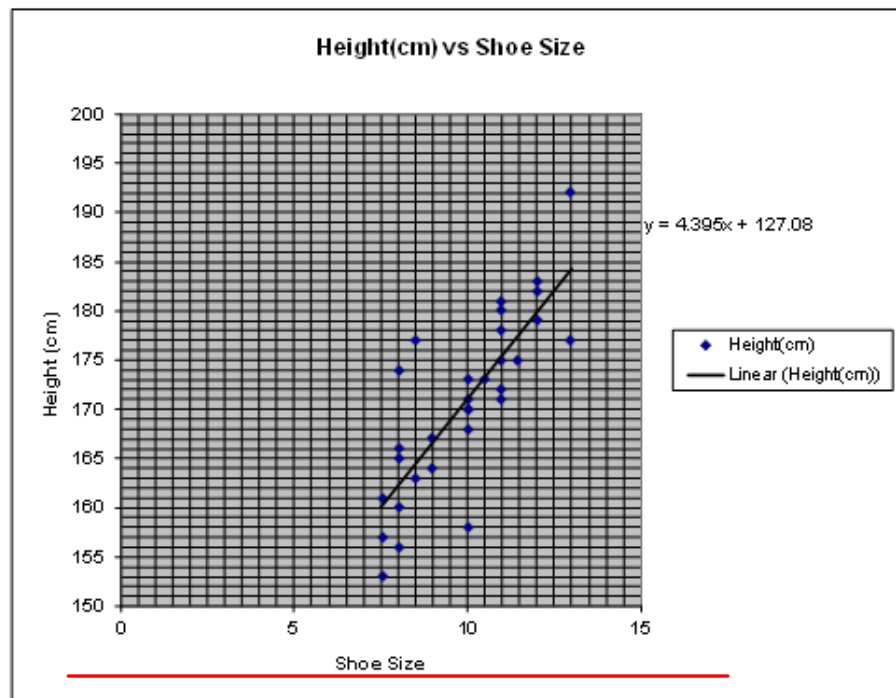
By the end of the class, I will be able to:

- a) recognize functions in various representations .
- b) determine the domain and range for a relation .
- c) determine if a relation is a function .

(Use **this scatter plot** for demonstration) **Answer B - G**

Shoe Size	Height(cm)
10	158
11.5	175
10	173
9	164
9	167
10	170
11	172
8	160
8	174
11	175
8	166
7.5	153
10	171
11	181
11	171
10	170
8	156
7.5	161
12	179
11	178
10.5	173
8.5	177
8	165
12	182
13	177
13	192
7.5	157
8.5	163
12	183
10	168
11	180

Page 4 INVESTIGATE THE MATH



Domain =  $\{7.5, 8, 8.5, 9, 10, 10.5, 11, 11.5, 12, 13\}$

# 1.1 Relations & Functions

## 1.4 Domain & Range

Date: Feb. 20/18  
(Every lesson)

**Relation:** A set of ordered pairs.

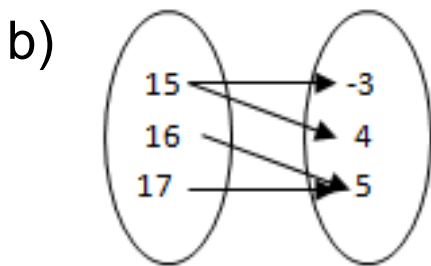
**Function:** A one-to-one relation.

ie. each  $x$ -value has only one corresponding  $y$ -value.

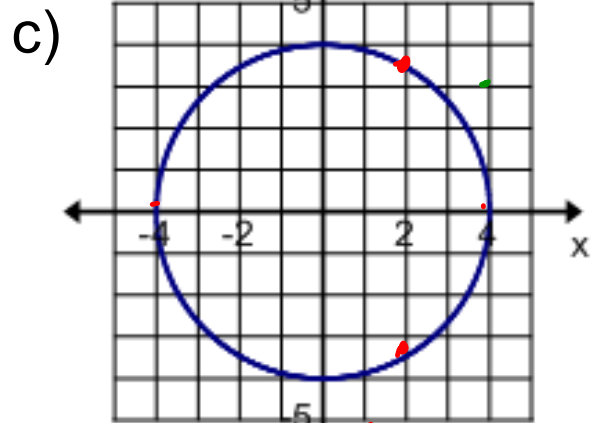
Ex.1 Determine if the following relations are functions.

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

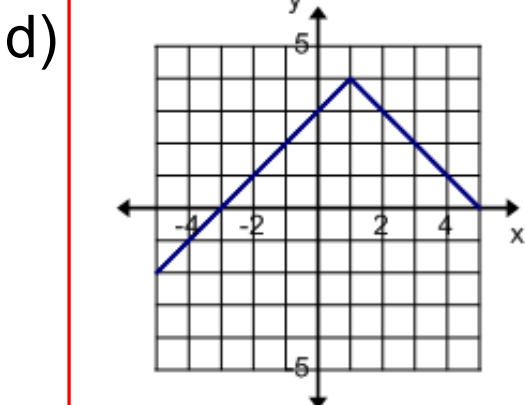
Not a function  $\because x=3$  is NOT unique.



Not a function  
 $\because 15$  maps to both  $-3$  and  $4$ .



VLT: Vertical Line Test  
NOT a function  
Fails VLT.



Yes this is a function;  
it passes the VLT.

e)

STUDENT NAME	HOCKEY PRACTICE NIGHT
Heather	Thursday
Scott	Tuesday
Galang	Thursday
Jet	Saturday

Yes, this is a function.

### Identifying Functions by equations

1. A linear equation is always a function unless it is a vertical line.

$$y = mx + b \quad Ax + By = C \quad Ax + By + C = 0$$

2. A Quadratic is a function in the form of

$$y = ax^2 + bx + c \quad y = a(x - h)^2 + k$$

3. A circle is **NOT** a function.

$$r^2 = x^2 + y^2$$

Ex.2

Circle which relations below are functions.

$$y = x^2 - 4$$

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

$$y = 3$$

$$3x + 4y = 1$$

$$x = 3$$

$$y = 3x^2 - 4x - 1$$

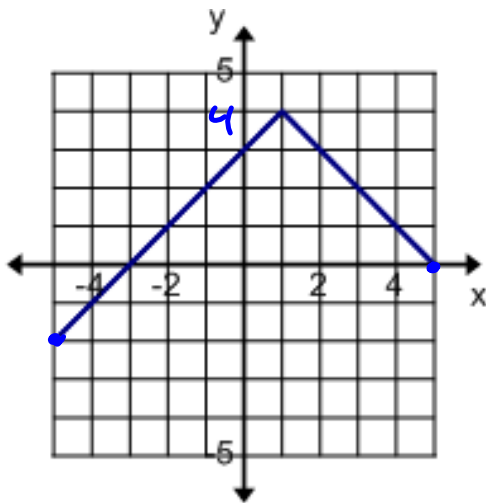
$$y = 3x - 4$$

$$x^2 + y^2 = 16$$

$$y = 3(x - 4)^2 - 3$$

$$(x - 2)^2 + (x + 3)^2 = 25$$

Describe the following graph's location on the axes.



*X's are between -5 and 5  
y-values are between -2 and 4.*

*Such that*  
 $D: \{x \in \mathbb{R} / -5 \leq x \leq 5\}$   
*all Real numbers : X is between -5 and 5  
... (and including)*

$R: \{y \in \mathbb{R} / -2 \leq y \leq 4\}$

We can describe relations mathematically using Domain & Range.

Domain: The set of  $x$ -values that form a relation.

Range: The set of  $y$ -values that form a relation.

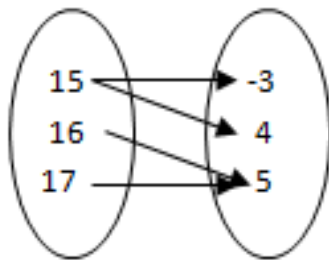
Ex. 3 State the Domain & Range for the following relations.

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

Domain:  $\{3, 4, 1, -1\}$  or Domain:  $\{-1, 1, 3, 4\}$

Range:  $\{2, -1, 1, 5\}$  or Range:  $\{-1, 1, 2, 5\}$

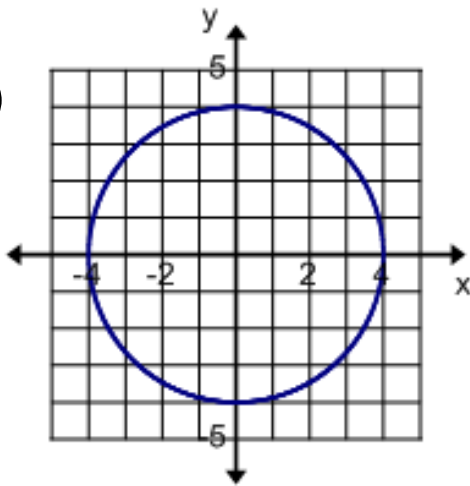
b)



Domain:  $\{15, 16, 17\}$

Range:  $\{-3, 4, 5\}$

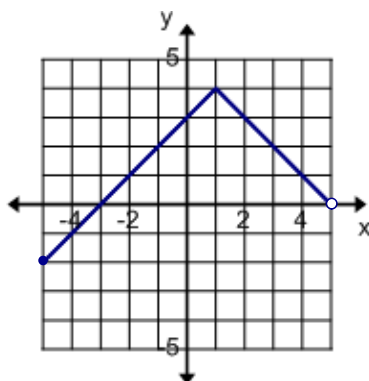
c)



Domain:  $\{x \in \mathbb{R} \mid -4 \leq x \leq 4\}$

Range:  $\{y \in \mathbb{R} \mid -4 \leq y \leq 4\}$

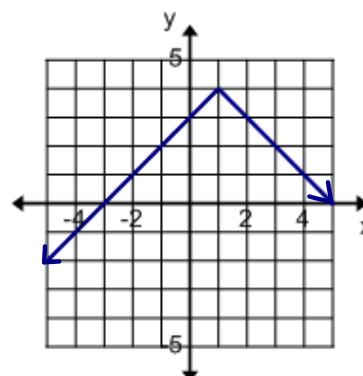
d)



Domain:  $\{x \in \mathbb{R} \mid -5 \leq x < 5\}$

Range:  $\{y \in \mathbb{R} \mid -2 \leq y \leq 4\}$

e)



Domain:  $\{x \in \mathbb{R}\}$

Range:  $\{y \in \mathbb{R} \mid y \leq 4\}$

versus

**BE READY for tomorrow's Unit SUMMATIVE!**

Today's Homework Practice includes:

***p. 2 #1 – 8***

**READ pp. 5-9**

pp. 10-11 #1 – 3, 6, 7a, 8, 9b

[p.13 #1-3]

pp. 35-36 #1 – 3, 5