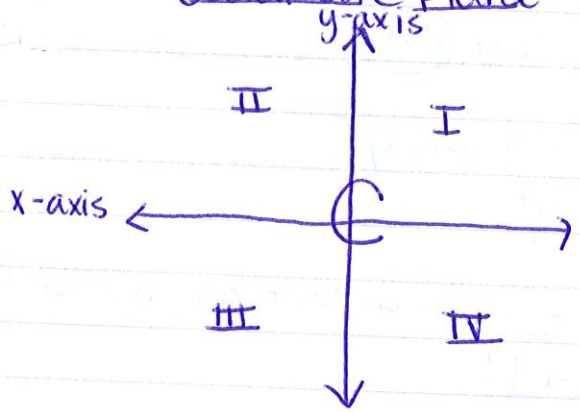
1-9 Patterns, Equations, Graphs

* You can use an equation with two variables to represent the relationship between two varying quantities. A solution of an equation with two variables x and y is any ordered pair (x, y) that makes the equation true.

Coordinate Plane



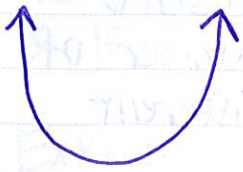
* Quadrant #'s go in the shape of a "C."

x	y
independent	dependent
domain	range
input	output
x-value	y-value

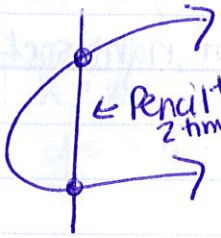
Function: A relation that assigns exactly one value in the range to each value in the domain. AKA: x values are <u>all</u> different

Relation: a set of ordered pairs

Function or Not?



- Yes, Function, because it pass the vertical line test (Pencil Test)



Not a Function because it does not pass the vertical line test.

$(\overset{x}{0},\overset{y}{1})(\overset{x}{2},\overset{y}{3})(\overset{x}{4},\overset{y}{5})$ - Function because all x values are different

$(\overset{x}{1},\overset{y}{2})(\overset{x}{1},\overset{y}{3})(\overset{x}{2},\overset{y}{3})(\overset{x}{3},\overset{y}{4})$ - Not a function because all x values are not different. (1's repeat)

* A solution of an equation with two variables x and y is any ordered pair (x, y) that makes the equation true.

Example 1: Is (3,10) a solution of the equation $y = 4x$?

$(\overset{x}{3},\overset{y}{10})$

$y = 4x$
$10 = 4(3)$
$10 \neq 12$

Not equal, so (3,10) is not a solution of $y = 4x$.

1) Substitute values for x and y
2) determine if both sides equal

Not equal means it is not a solution

equal means it is a solution

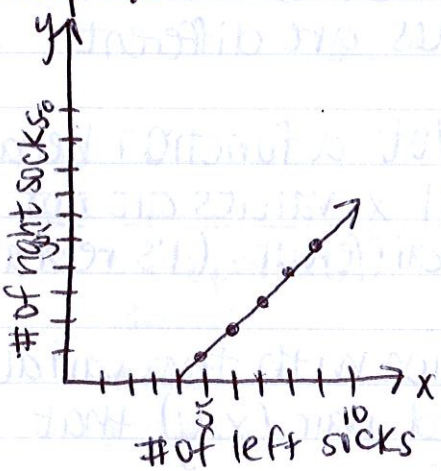
Ex2: You have 4 more left socks than right socks. How can you represent the relationship between the number of left and right socks in three different ways?

Let x = # of left socks Let y = # of right socks

1) Table

x	5	6	7	8	9
y	1	2	3	4	5

2) Graph



3) Equation

$y = x - 4$

Inductive Reasoning is the process of reaching a conclusion based on an observed pattern. You can use inductive reasoning to predict values.

Ex3) The table shows the relationship between the number of chairs and the total number of legs.

a) Extend the pattern. What is the total number of legs on 10 chairs?

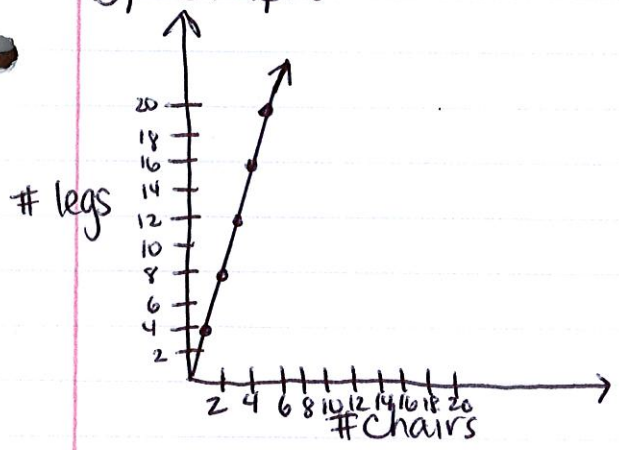
x = # of chairs
y = # legs

Table

x	1	2	3	4	5
y	4	8	12	16	20

(x4 between each column)

b) Graph



c) Equation

$y = 4x$

*Check your equation with values from the table.

Check:
$(1, 4)$
x, y

$4 = 4(1)$
$4 = 4$ ✓