☺ Chapter 4 Notes ☺

4.2 – Function Notation

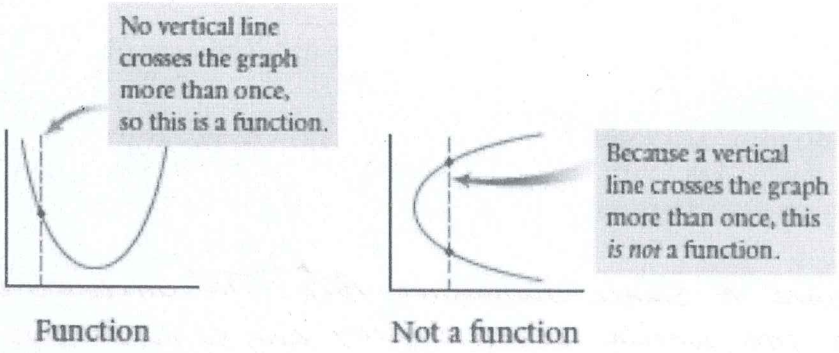
Daily Objective:

1. Define function
2. Review function notation
3. Review the vertical line test for functions
4. Distinguish between functions and relations
5. Define domain and range of a function

Relation: any relationship between variables

Function: a special type of a relation where each independent variable (x), is assigned exactly one dependent variable (y).

Each x has exactly one y.



Function Notation: $y = f(x)$ "f of x" y is a function of x

x goes into the rule/equation f and y comes out

******* f(x) does not mean f times x *******

****** You do not have to use the letter *f* for function notation, you may pick another letter ******

Does the definition of function require that there be only one value of x for each value of y?

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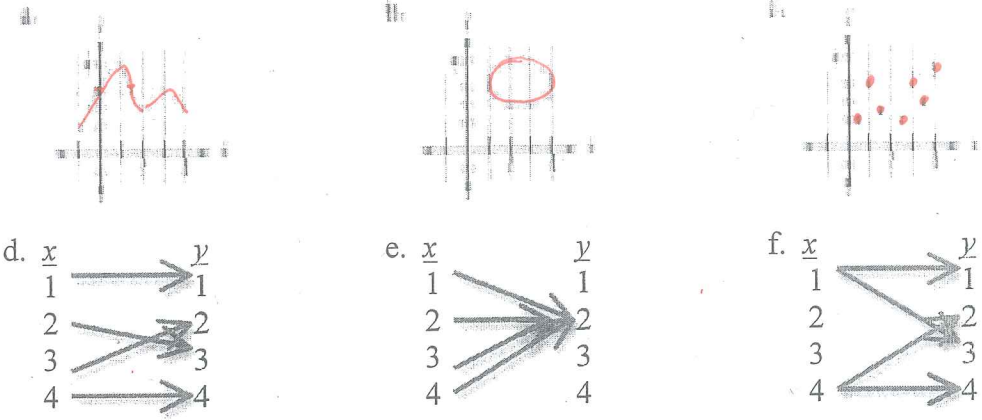
Investigation
To Be or Not to Be (a Function)



d.

x	y
1	1
2	2
3	3
4	4

e.

x	y
1	1
2	2
3	3
4	4

f.

x	y
1	1
2	2
3	3
4	4

g. Independent variable: the age of each student in your class
Dependent variable: the height of each student

h. Independent variable: an automobile in the state of Kentucky
Dependent variable: that automobile's license plate number

I Independent variable: the day of the year
Dependent variable: the time of sunset

Step 1: Identify each relation that is also a function. For each relation that is not a function, explain why not.

a) FUNCTION

b) NOT A FUNCTION – THERE ARE x-VALUES WITH MORE THAN 1 y-VALUES

c) FUNCTION

d) FUNCTION

e) FUNCTION

f) NOT A FUNCTION
1 IS PAIRED WITH 2 y (1, 3)
4 IS PAIRED WITH 2 y (2, 4)

g) NOT A FUNCTION
STUDENTS MIGHT HAVE SAME AGE BUT DIFF HEIGHT
16 → 6'0
16 → 6'2

h) FUNCTION
EACH AUTO HAS OWN #

i) IF ONE YEAR ONE LOCATION: FUNCTION
IF MULTIPLE YEARS: NOT A FUNCTION
IF MULTIPLE LOCATIONS: NOT A FUNCTION

Step 2: For each graph or table that represents a function, find the y-value when x = 2, and find the x-value(s) when y = 3. Write each answer in function notation.

a) $f(2) = 2$
$f(0) = 3$ and $f(1.5) = 3$

c) $f(2)$ is undefined
$f(1) = 3$ and $f(3) = 3$

d) $f(2) = 3$
$f(2) = 3$

e) $f(2) = 2$
no x-value results in $y = 3$

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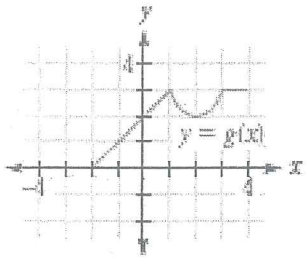
Example 1: Function g is defined by the graph below:



Find these values:

g(-2) = 0 g(0) = 2 g(1) = 3 g(4) = 3

Find x when $g(x) = 0$. -2

What is the range? $0 \le g(x) \le 3$

What is the domain? $-2 \le x \le 4$

Example 2: Given $f(x) = 2x - 4$, find the values below:

a. f(1) $= 2(1) - 4$
$= 2 - 4$
$f(1) = -2$

b. f(9) $= 2(9) - 4$
$= 18 - 4$
$f(9) = 14$

c. f(-3) $= 2(-3) - 4$
$= -6 - 4$
$f(-3) = -10$

Example 3: Given $h(x) = \dfrac{2x+5}{x-3}$, find the values below:

a. h(8) $= \dfrac{2(8)+5}{8-3}$
$= \dfrac{16+5}{5}$
$= \dfrac{21}{5}$
$h(8) = 4\frac{1}{5}$

b. h(-7) $= \dfrac{2(-7)+5}{-7-3}$
$= \dfrac{-14+5}{-10}$
$= \dfrac{-9}{-10}$
$h(-7) = \dfrac{9}{10}$

c. h(15) $= \dfrac{2(15)+5}{15-3}$
$= \dfrac{30+5}{12}$
$= \dfrac{35}{12}$
$h(15) = 2\frac{11}{12}$