2.1 Functions

A function from X to Y is a relation that associates with each element of X exactly one element of Y (meaning: for every X-value there is exactly one Y-value).

*Other terms used for X & Y values:

X-value: Domain or input value
Y-value: Range or output value

Ex. 1 Determine if each set is a function. If yes, state the domain and range.

a) {(1,4),(2,5),(3,6),(4,7)}

b) {(1,4),(2,4),(3,5),(6,10)}

c) {(-3,9),(-2,4),(0,0),(1,1),(-3,8)}

Consider the equation $y=2x-5 \quad 1 \leq x \leq 6$ is the domain (x-values). Is this a function?

Function Notation

Functions are often denoted by letters such as f,F,g,G and so on. If f is a function, then for each number x in its domain the corresponding image (output) in the range is denoted by f(x) (read "f of x"). F(x) = y

We could write the same equation as $f(x)=2x-5$, $1 \leq x \leq 6$

f(1) =

f(5) =

****Look at figures 5 & 6 on pg. 86

Ex. 2 for function $f(x)=2x^2-3x$ evaluate:

a) f(3) b) f(x) + f(3) c) f(-x) d) -f(x) e) f(x+3)

Ex. 3 Determine if the equation x2+ y2= 1 is a function. Hint: solve for y

2.1 cont. Domain of a function

Often the domain of a function is not specified, instead only the equation defining the function is given. The domain will be all X values that has a real number value for f(x).

Ex. 4 Find domain of each function

a) f(x) = x2+ 5 b) g(x) = $\frac{3x}{x^2-4}$ c) h(t) = $\sqrt{4-3t}$

Vertical line test (for functions)

Since every x-value can only have exactly one y-value, you can check if a graph is a function by making a vetical line along the graph. If more than one point appears on the vertical line.....NOT a function.

Ex. 5 which graphs are functions?

a)

b)

c)

d)

Ex. 6 Obtaining info about a graph of a function f(x) = $\frac{x}{x+2}$

a) Is (1,½) on the graph of f?
b) If x = -1, what is f(x)?
c) If f(x) = 2, what is x?

Graphing Calc: yl = Table can verify answers

Above....why is there an error message for X = -2 ?

Ex. 7 Average Cost Function: c=cost x=computers per day

Function given: c(x) = 0.5x2- 34.39x + 1212.57 + 20,000/x

Determine average cost of manufactoring the following:
a) 30 computers in a day

b) Look at part e from ex. 13 on pg. 94 (set up on graphing calculator)