NOTES: Function Notation and Evaluating Functions

For each pair of variables a) tell which is the independent variable and dependent variable
b) write a sentence giving the relationship between the two variables

depends on ____ **OR** ____ **is a function of**

- the number of wildflowers and spring rainfall (D) (I)
  The number of wildflowers depends on the spring rainfall
  same meaning
- the amount of stagnant water and the number of mosquitoes
  The number of mosquitoes depends on the amount of stagnant water
- A(d), where A = Area and d = diameter
  The Area is a function of the diameter
- L(R), where L = river level and R = amount of rainfall
  The River Level is a function of the rainfall
- D(n), where n = the number of lawns mowed and D = Dollars earned
  Dollars earned is a function of the # of lawns mowed

Dep (Indep)

How much money would you earn if you charged $30 per lawn and you mowed 5 lawns on Saturday?

"D of n" $30 \cdot 5 = 150$

What is the "function notation" used to represent this situation??

If $D(n) = 30n$, what is the value of D(4)? What is the value of D(10)?

$30(4) = \$120$

Dollars earned for mowing 10 lawns
$30(10) = \$300$

Find the value of each function: How much money is earned for 4 lawns?

If $f(x) = 3x-5$, find $f(4)$.

Find the value of the function when $x=4$

$f(x) = 3x - 5$

$f(4) = 3(4) - 5$

$f(4) = 7$

"The value of the function is 7 when $x = 4$"

If $g(x) = 10 - x^2$, find $g(6)$ and $g(3)$.

$g(6) = 10 - (6)^2$

$= 10 - 36$

$\boxed{g(6) = -26}$

$g(3) = 10 - (3)^2$

$= 10 - 9$

$\boxed{g(3) = 1}$

If $h(x) = 2x^2$, find $h(5)$ and $h(-2)$.

$h(5) = 2(5)^2$

$= 2(25)$

$\boxed{h(5) = 50}$

$h(-2) = 2(-2)^2$

$= 2(4)$

$\boxed{h(-2) = 8}$

Find the value of x so that the function has the given value

If $f(x) = 3x - 4$ and $f(x) = -2$

$-2 = 3x - 4$

$+4 \quad +4$

$\frac{2}{3} = \frac{3x}{3}$

$\boxed{x = \frac{2}{3}}$

If $g(x) = -\frac{2}{3}x + 1$ and $g(x) = -3$

$-3 = -\frac{2}{3}x + 1$ (multiply by 3)

$-9 = -2x + 3$

$-3 \quad -3$

$-12 = -2x$

$\boxed{x = 6}$

Discrete; List Reasonable values

NOTES Reasonable Domain and Range

Example 1: Admission to a carnival is $7.00 and each ride is $3.00.

Independent Variable (n) # of rides

Dependent Variable(c) total cost

Function Rule $C(n) = 3n + 7$

Discrete or Continuous

Domain $\{0, 1, 2 \ldots\}$

Range $\{7, 10, 13 \ldots\}$

Example 2: A 150 gallon jug has a small hole in it. Water is leaking out at a rate of 2 gallons per hour.

Independent Variable (x) # of hours

Dependent Variable(y) amount remaining

Function Rule $y = 150 - 2x$

Discrete or Continuous

Domain $0 \leq x \leq 75$ ← $0 = 150 - 2x$

Range $0 \leq y \leq 150$

1) A local youth group is planning a trip to a local amusement park. They are taking their church bus which holds 32 people. It will cost $25 for parking and tickets to enter the park are $22.50 per person.

Independent Variable (n) _____ Dependent Variable(C) _____

Function Rule $C(n) = 25 + 22.50(n)$ Discrete or Continuous

Domain $\{1, 2 \ldots 32\}$ $\{0, 1 \ldots$ Range $\{47.50, 70, \ldots 745\}$ $\{25$

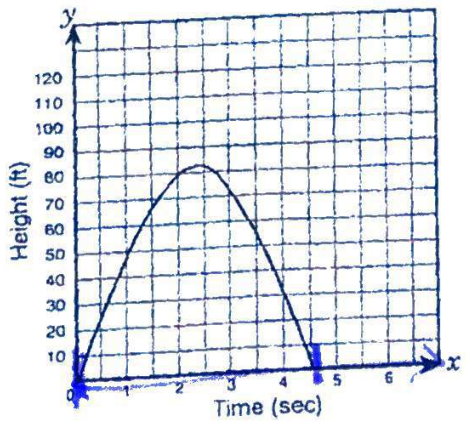
2) Ms. Maniscalco is driving from New York, NY to Austin, TX which is approximately 1,800 miles. She drives at an average rate of 65 miles per hour. Write a function rule representing the number of miles REMAINING on the drive as a function of the hours driven.

Independent Variable ( ) hours Dependent Variable( ) miles remaining

Function Rule $1800 - 65(x)$ Discrete or Continuous

Domain $0 \leq x \leq 27.7\ldots$ Range $0 \leq y \leq 1800$

3) A ball was thrown into the air with an initial velocity of 72 feet per second. The height of the ball after t seconds is represented by the equation $h(t) = 72t - 16t^2$. The graph of the function is shown to the right.



Independent Variable ( ) Time (sec)

Dependent Variable( ) height (ft)

Function Rule $h(t) = 72t - 16t^2$

Discrete or Continuous

Domain $0 \leq x \leq 4.5$ Range $0 \leq y \leq 83$