Name:

HW 4: §1.3-1.5

Complete the following problems to the best of your ability. **SHOW ALL OF YOUR WORK.** Unshown work will not be graded. You may use a calculator.

1. Given the following table, find a linear equation that models the data.

x	0	2	4	6
y	3	5	7	9

$y = x + 3$

2. Suppose the linear equation $R = 2G+4$ models the number of rainfalls in a given month, R, as a function of the number of goats sacrificed to the rain god, G.

   (a) If the village sacrifices 4 goats, how many times will it rain?

   $R = 2(4) + 4 = 12$

   12 rainfalls

   (b) How many goats should the villagers sacrifice if they need it to rain at least 16 times in a month?

   $16 = 2G + 4$

   $12 = 2G$

   $6 = G$

   6 goats

   (c) If the villagers experience a religious reformation and stop sacrificing goats, how many times will it rain in a month?

   $2(0) + 4 = 4$ times

3. For the following functions, state the Independent Variable, the Dependent Variable, and determine whether the relation is a function or not. Explain your reasoning.

   (a) Student as a function of first name.

   DV IV

   No! Multiple students could have the same name

   (b) Temperature as a function of time of day.

   DV IV

   Yes: only 1 temperature at a given time

4. Does the equation $4x^3 + 2 = y^2$ define x as a function of y?

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

   $x^3 = \frac{y^2-2}{4}$

   $x = \sqrt[3]{\frac{y^2-2}{4}}$

5. Let $f(x) = \sqrt{2x+4}$.

   (a) Evaluate $f(3)$.

   $f(3) = \sqrt{2(3)+4} = \sqrt{10}$

   (b) Find the net change of f from -1 to 3.

   $f(3) - f(-1) = \sqrt{10} - \sqrt{2}$

   (c) What is the domain of f?

   $2x + 4 \geq 0$

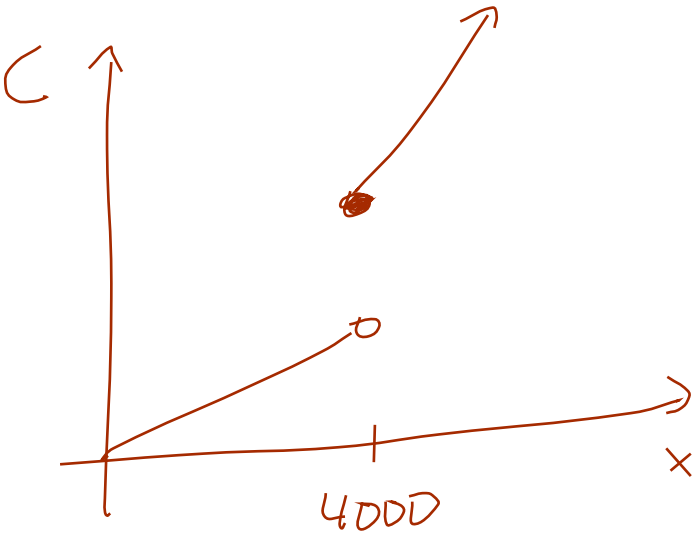
   $2x \geq -4$

   $x \geq -2$

   $[-2, \infty)$

6. A water company charges \$.0008 per gallon for households using less than 4000 gallons of water a month and \$.012 for households that use 4000 gallons or more a month. Come up with a piecewise function that gives $C(x)$, the cost of a household's water bill, as a function of x, the number of gallons of water the household uses. **Sketch a graph of this function.**

$$C(x) = \begin{cases} .0008x & x < 4000 \\ .012x & x \geq 4000 \end{cases}$$



Optional Problems:
1.3: All
1.4: All
1.5: All