Assignment 9

Math 1030

Due Friday, November 9th

1. **Functions**

   (a) Suppose we make a table of barometric pressure readings every morning at 6:00 AM. In the left column we have the date of the reading, and in the right column we have the reading.

      i. Does this represent a function? Explain why.

      ii. If so, what is the dependent variable?

      iii. What is the independent variable?

   (b) We are given that a function $f(x)$ is odd and has period 3. If $f(1) = 4$ what are:

      i. $f(-1)$?

      ii. $f(4)$?

      iii. $f(-7)$?

2. **Linear Modeling**

(a) Suppose you are giving out candy to trick-or-treaters and you start the night at 6:00 PM with 160 candies. Each hour you give away 30 candies, and you have trick or treaters for 5 hours.

i. Can you create a linear model for this? What would be the slope and initial value of your linear model? What would be the linear equation?

ii. Construct a graph of this linear model over the given time, treating time 0 as 6:00 PM.

iii. How many candies will you still have for yourself at the end of the night?

(b) What is the equation for the line that goes through the points $(3, 5)$ and $(5, 12)$?

3. **Exponential Modeling**

(a) Suppose you start a bank account with $1000 at a 4% interest rate.

i. Construct an exponential equation that models the growth of the money in this account.

ii. Construct a graph of this equation, representing how the amount of money in the account grows over time, for the first ten years of the accounts existence.

(b) The amount of a given drug in a person's bloodstream decreases by 10% each hour.

i. Construct an exponential model for how the amount of drug in the bloodstream decreases with time using the rate of change.

ii. What is the half-life of this drug in the bloodstream?