

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.
- Does this represent a function? Explain why.
 - If so, what is the dependent variable?
 - 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:
- $f(-1)$?
 - $f(4)$?
 - $f(-7)$?

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