

Homework #9

Instructions: Do the following problems on a **separate** sheet of paper.

1. The population of zombies in Hurricane, Utah is doubling every 6 days! When Mildred counted this morning, there were 245 of them.
 - (a) How many zombies will there be in 3 weeks?
 - (b) When was there only one zombie?
 - (c) When will the entire town (population 8,250) become zombies?

2. Carbon-14 has a half-life of 5730 years.
 - (a) How long does it take for the amount of Carbon-14 to decrease by 10%?
 - (b) What percentage of its original Carbon-14 does a fossil have that is 200,000 years old?
 - (c) How old is a fossil that has 30% of its original amount of Carbon-14?

3. Suppose that the population of killer bees in the United States has been increasing at a steady rate of 2% per year.
 - (a) How often does the number of bees double?
 - (b) How often does the number of bees triple?
 - (c) If there were 85,000 killer bees in the U.S. in the year 1990, how many are there now?

4. Suppose that the number of monkey attacks in Japan is declining at a rate of 6.2% per year.
 - (a) Find the amount of time it takes for the number of monkey attacks to be cut in half.
 - (b) If there were 18 monkey attacks this year, how many monkey attacks were there in 1995?
 - (c) If there were 18 monkey attacks this year, in what year will only 5 monkey attacks occur?

5. Suppose that Alfred has an ant colony who's population is doubling every 5 months.
 - (a) How often does the population of the ant colony triple?
 - (b) If there were 450 ants one year ago, how many are there now?
 - (c) If there were 450 ants one year ago, when will the population reach 10,000?

6. Suppose the number of alien visits is cut in half every 200 years. Further suppose that there were 860 alien visits in 1950.
 - (a) How many alien visits were there in 2000 BCE?
 - (b) In what year will there be only 100 alien visits?
 - (c) What is the percentage rate of decay per year? (hint: use $t = 1$)