1. Five years after a species of turtle was introduced into a wetland a biologist did a survey and estimated a total population of 300 turtles. In a follow up survey five years later the biologist estimated the population was 450 population.

   (a) What is the average rate of change in turtles per year?

   (b) Assuming linear growth what do you estimate for the initial number of turtles according to this model?

   (c) Find an expression for the number of turtles as a function of years since they were introduced to the wetland.

   (d) How long does this model predict it will take for the population to exceed 1000 turtles

2. In 1990 the diameter of the trunk of an old growth cedar tree was measured to be 49 cm. In 2002 its diameter was 55 cm. Assuming linear growth find an expression for the diameter of the tree as a function of years since 1990. When will the tree be 100 metres wide?

3. According to industry sources the global wireless infrastructure market is growing at 20% annually. In the US every minute 26 more people sign up for wireless phone service. Which of these two statements implies linear growth and which exponential growth?

4. The following formulas give the populations (in 1000s) of two different cities, A and B, as a function of time since 1980. $P_A = 400 + 9t$ and $P_B = 270(1.021)^t$.

   (a) Describe in words how each of these populations is changing over time in years. In your description make sure you indicate the physical meaning of each number in the formula.

   (b) If the growth continues as described by these formulae which city will eventually be the largest?

5. During warm months in many locations, the mosquito population increases rapidly after a heavy rain. The table below shows a typical accumulated trap count of mosquitoes at a site. Trap counts were recorded at 8-hour intervals for 3 days following a 1-inch rainfall. Let n be the cumulative trap count at this location t time intervals after a heavy rain.

Time Intervals (t)	0	1	2	3	4	5	6	7	8	9
Trap Count (n)	450	495	545	600	660	726	800	880	968	1065
Change	n/a									
Percent Change	n/a									

   (a) Complete the table to show the change in the trap count during each 8-hour time interval.

   (b) Find the percent change in the trap count for each time interval and record your results on the chart.

   (c) Would a function that models this data be linear or exponential? Why does your choice seem reasonable, and why does the other choice not seem reasonable?

   (d) Write a formula expressing trap count n as a function of time intervals t which could be used to model this data.

   (e) Use your formula to predict the trap count after 12 time intervals.