Logarithms & their uses

1. Cholera, an intestinal disease, is caused by a cholera bacterium that multiplies exponentially by cell division as modeled by $A = A_0 e^{1.386t}$ where A is the number of bacteria present after t hours and A_0 is the umber of bacteria present at time $t = 0$. Assume that we start with 1 bacterium.

   (a) How many bacteria are present after 5 hours?

   (b) Find when there are 1,000,000 bacterium.

2. An exponential model for data on rubella is given by $A = 54988 \cdot 0.799^t$ where A is the number of reported cases of rubella and t is years with $t = 0$ representing 1970.

   (a) Use the model above to predict the number of rubella cases in 2000.

   (b) Find the year when the number of rubella cases reached 200.

3. The population of zombies is 2 on Wednesday and 5 a day later.

    (a) If the population continues to grow exponentially, how many zombies will there be in a week?

    (b) How long until the population of UW Tacoma is gone?
        (note: UW Tacoma has about 5000 students)