Discrete Exponential Growth and Decay Examples

1) Assume there are 10,000 alligator eggs in an Everglades habitat. Each day 1/20 of the eggs are lost to predation.
   a) Setup a recursion using N_t and N_{t+1}, where N_t is number of eggs remaining at time t days.
   b) Determine how many egss remain after 4 days.
   c) Determine the exponential decay formula for N_t.
   d) When will the original number of eggs be depleted by 60%.

2) Assume an intial amount of $N_0 = 5$, the population doubles every 20 days and the units of time t is in 30 days (~month).
   a) Determine an exponential growth formula N_t for $t = 0, 1, 2, 3, \ldots$

3) Assume that the number of lady bugs in your garden is initially 50 and each week this amount doubles.
   a) Setup a recursion using N_t and N_{t+1}, where N_t is number of lady bugs at time t weeks.
   b) Determine the exponential growth formula for N_t.
   c) When will the number of lady bugs reach 51,200?