PC 3-3

I can model populations using exponential growth and decay equations

Uninhibited Growth Model:

$$N(t) = N_0 e^{kt}\,, k > 0$$

Define each piece of the equation below:

N_0 :
k :
t :

The number *N* of bacteria present in a culture at time *t* (in hours) obeys the equation

$$N = 1000e^{0.01t}$$

a) After how many hours will the population equal 1500?

b) Using a graphing utility, graph the relation between *N* and *t*. Verify your answer in (a) using INTERSECT.

Uninhibited Decay Model:

$$A = A_0 e^{kt} \quad , k < 0$$

Define each piece of the equation below:

A_0 :
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Iodine-131 is a radioactive material that decays according to the equation $A = A_0 e^{-0.087t}$, where A_0 is the initial amount present and A is the amount present at time *t* (in days). What is the **half-life** of iodine-131?

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