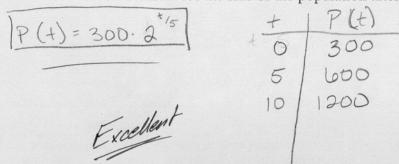
Each problem is worth 5 points. Clear and complete justification is required for full credit.

1. Suppose that a population of nasty mutant flesh-eating bacteria is doubling every 5 hours, and that initially there were 300 bacteria. Give a formula for the size of the population after t hours.



2. Suppose that the amount of radioactive strontium in a town's water supply is given by $S(t) = 5000 \cdot 2^{-t/29}$, where t is in years and S(t) is in grams. How long will it take until less than 1000 grams remain?

$$s(t) = 5000 \cdot (\frac{1}{2})^{t/29} \qquad \frac{\ln 1 - \ln 5}{\ln 1 - \ln 2} \leq t/29$$
when will
$$1000 \leq 5000 \cdot (\frac{1}{2})^{t/29} \qquad -\ln 2$$

$$\frac{1000}{5000} \leq \frac{1}{2} \leq \frac{$$

29 (ln 5) L t check: $5(67.3359) = 5000 \left(\frac{1}{5}\right)^{67.3359/29}$ = 1000 S (67-3360) = 5000. \frac{1}{2} 67.3360/29 = 999.9979