Quiz 4

The growth rate of a population of bacteria is proportional to the current population. If there are initially 100 bacteria, and after 1 hour there are 200 bacteria, how many are there after 2 hours?

$P' = kP$, so $P(t) = Ae^{kt}$

@ $t = 0$: $100 = Ae^{k(0)}$, so $A = 100$

$$P(t) = 100e^{kt}$$

@ $t = 1$: $200 = 100e^{k(1)}$

$$2 = e^{k}$$

$$k = \ln 2$$

$$P(t) = 100e^{(\ln 2)t}$$

$$= 100(2)^{t}$$

$$\boxed{P(2) = 400}$$