Quiz **Name**

1. A bacteria culture is in its exponential growth phase. It has 1000 bacteria when it is first observed at time $t = 0$. Two hours later there are 4000 bacteria.

a) Determine the growth constant μ of the culture and express the number $y(t)$ of bacteria at any time $t \geq 0$ in terms of an exponential function.

b) What is the size of the population after 5 hours?

c) At what time will the population reach 30,000?

2. A radiation counter shows that a certain radioactive substance disintegrates at a rate of 8.67×10^{13} atoms per minute at a certain time and at a rate of 7.67×10^{12} atoms per minute 6 minutes later. Determine the disintegration constant of this radioactive substance.

Formulas: $y(t) = y_0 e^{\mu t} \quad \mu = \frac{\ln 2}{d} \quad y'(t) = \mu y(t) \quad y(t) = y_0 e^{-\lambda t} \quad \lambda = \frac{\ln 2}{h} \quad y'(t) = -\lambda y(t)$