Name:_____ **Date**:_____

NB. No calculators allowed.

Problem 1 (4 points)**.** A colony of E. Coli is growing in a petri dish, doubling in quantity every minute. If the initial population of the colony is 1000, what is the equation that models the growth of the population? Determine the time t at which the population count reaches 10000.

Problem 2 (3 points)**.** Compare the sizes of $\log_3 11$ and $\log_5 24$, and justify your answer. *Hint*: "Compare the sizes" means one of the (mutually exclusive) following should be proved:

$$\log_3 11 < \log_5 24 \quad \text{or} \quad \log_3 11 = \log_5 24 \quad \text{or} \quad \log_3 11 > \log_5 24.$$

Problem 3 (3 points)**.** Find the x- and y-intercepts of

$$y = 2 - \log_7(x + 3).$$