City Semester Name:_____

A little quiz

Complete all work on a separate sheet of paper with exercises clearly labeled and all reasoning and work given.

1. The following three equations model the populations for three different towns a, b, and c in years:

   (i) $P_a(t) = 1000(1.12)^t$

   (ii) $P_b(t) = 2500(.8)^t$

   (iii) $P_c(t) = 500(2)^2$

   (a) Which towns have growing populations? Which have shrinking populations?

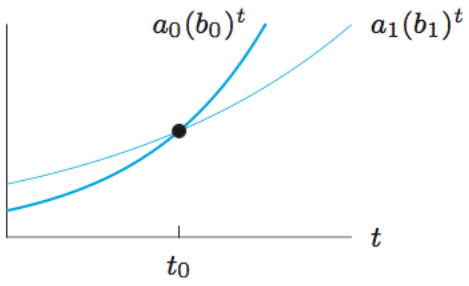
   (b) Which town is growing the fastest? What is its annual percent growth?

   (c) What is the population of town b after 10 years?

2. An exponential function of the form $y = ab^x$ passes through the points $(-2, 400)$ and $\left(2, \frac{2}{5}\right)$. Find the equation of this exponential.

3. Explain how to distinguish a linear function from an exponential function.

4. (anyone can try it, but this is required for intensive). Note: t_0 is the x-coordinate of the point where the two exponentials meet.



   (a) What happens to t_0 if a_0 is increased while a_1, b_1 and b_0 remain fixed?

   (b) What happens to t_0 if b_1 is decreased while a_1, b_0 and a_0 remain fixed?