Functions & Trig Name ______________________________
Exponential Models Practice 1

1.) Which function represents exponential decay?

(A) $y = 2^{0.3t}$ (B) $y = 1.2^{3t}$ (C) $y = \left(\frac{1}{3}\right)^{-t}$ (D) $y = 5^{-t}$

2.) The student enrollment E of a high school was 1310 and has increased by 10% per year. Which exponential model represents the school's student enrollment in terms of t, where t is the number of years?

(A) $E = 0.1(1310)^t$ (B) $E = 1.1(1310)^t$

(C) $E = 1310(0.1)^t$ (D) $E = 1310(1.1)^t$

3.) The number of songs (in millions) sold by an online music store can be modeled by the equation: $y = 100(1.08)^t$, where t is in the **years**. Find the approximate model that represents the **monthly** percent increase in sales.

(A) $y = 100(1.0065)^{12t}$ (B) $y = 100(1.0065)^t$

(C) $y = 100(1.08)^{12t}$ (D) $y = 100(2.518)^t$

4.) A population of flies in a lab, $p(x)$, can be modeled by the function $p(x) = 30(1.55)^x$, where x represents the number of **days** since the population was first counted.

a. By what percent, did the fly population increase each day?

b. In terms of **hourly** rate growth, write an equation that represents the fly population.

c. By what percent, ***to the nearest tenth***, did the fly population increase each hour?

5.) Researchers in a local area found the population of rabbits with an initial population of 20, grew exponentially at a rate of 8% per month. The fox population had an initial population of 30, and grew exponentially at a rate of 3% per month.

Find, ***to the nearest tenth*** of a month, how long it takes for these populations to be equal.

6.) The value, *V*, of an automobile after t years can be modeled by the function: $V = 15,000(0.81)^t$.

What is the percent of change each year for the automobile?

(A) 11% (B) 19% (C) 81% (D) 89%

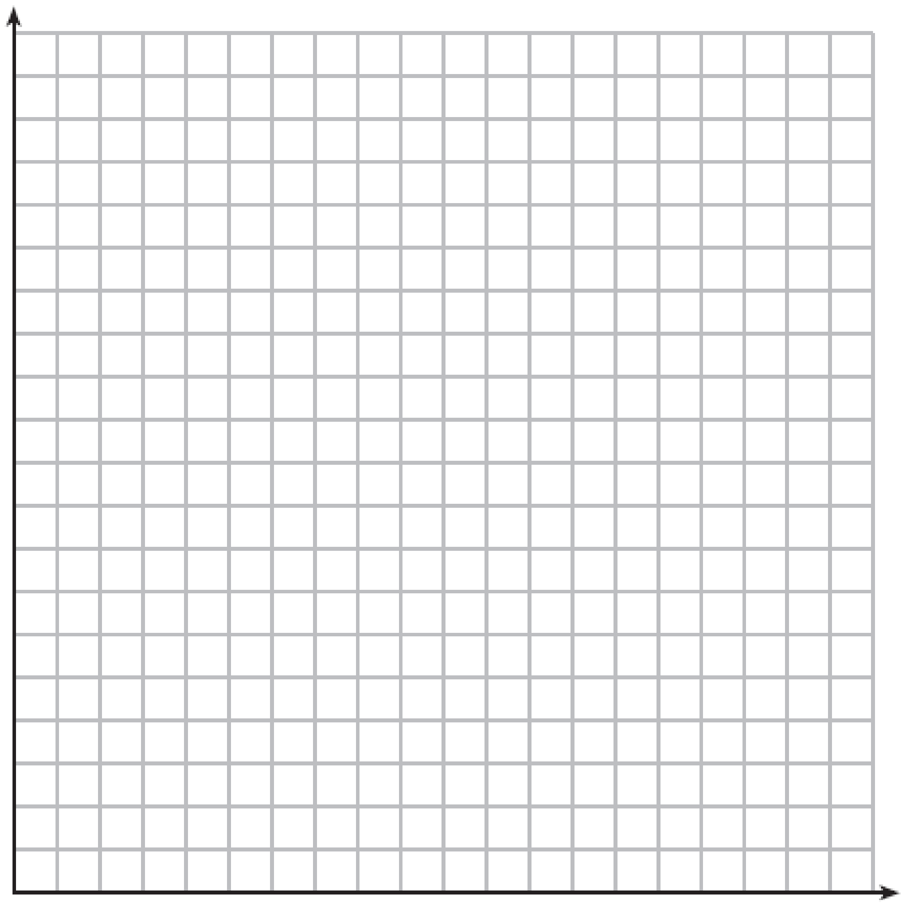
7.) A house purchased 6 years ago for $150,000 was just sold for $200,000.

Assuming exponential growth, approximate the annual growth rate, ***to the nearest percent***.

8.) The value of a passenger car based on its use in years is modeled by $V(t) = 28,000(0.65)^t$, where $V(t)$ is the value in dollars and t is the time in years.

Zach had to take out a loan to purchase the passenger car and is modeled by $L(t) = 20,000(0.7)^t$.

a. Graph $V(t)$ and $L(t)$ over the interval $0 \le t \le 5$, on the set of axes below.



b. State when $V(t) = L(t)$, ***to the nearest hundredth***, and interpret its meaning in the context of the problem.