Determining Rate of Growth or Decay

Name_____

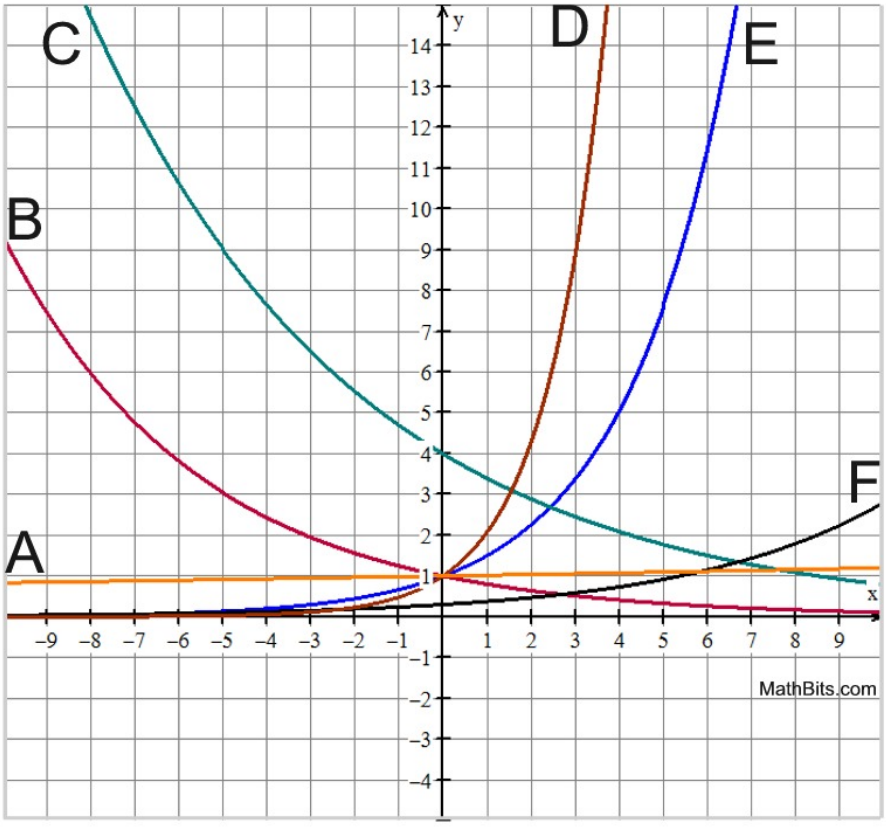
I. *Directions:* In each situation, state whether the equation is exponential growth or decay, and state the percent rate of change. Round to *nearest hundredths* if needed.

Equation	Growth or Decay	% Rate of Change
1. $y = (0.80)^x$		
2. $y = (1.5)^x$		
3. $y = 4(0.85)^x$		
4. $y = 0.3(1.25)^x$		
5. $y = (1.2)^{4x}$		
6. $y = (1.2)^{x/10}$		

Explain how to decide whether the equation is exponential growth or decay.

II. *Directions:* Match the exponential equation with its graph.

1. $y = (0.80)^x$	
2. $y = (1.5)^x$	
3. $y = 4(0.85)^x$	
4. $y = 0.3(1.25)^x$	
5. $y = (1.2)^{4x}$	
6. $y = (1.2)^{x/10}$	



Percent of Exponential Growth and Decay

Name_____

Directions: Round answers to *nearest integer* unless the problem dictates otherwise.

1. A flu outbreak hits an elementary school on Monday, with an initial number of 20 ill students coming to school. The number of ill students then increases by 25% per hour.

a) Is this situation an example of exponential growth or exponential decay?

b) Write an exponential function to model this Monday flu outbreak.

c) How many students will be ill after 6 hours?

2. A total of 50,000 contestants participate in an internet on-line survivor game. The game randomly kills off 20% of the contestants each day.

a) Is this situation an example of exponential growth or exponential decay?

b) Write an exponential function to model this game.

c) How many contestants are left in the game at the end of one week?

3. A new sports car sells for $35,000. The value of the car decreases by 18% annually. Write an exponential function to model the depreciation on this car.

4. At the end of last year, the population of a small town was approximately 75,000 people. The population is growing at the rate of 2.4% each year. In how many years will the population reach 100,000 people?

5. Iodine-131 is a radioactive isotope used in the treatment of thyroid conditions. It has a half-life of 8 days. Half-life is the amount of time it takes for half of the substance to decay (disappear). If a patient is given 20 mg of iodine-131, how much of the substance (rounded to the *nearest hundredth*) will remain in the body after 32 days?

6. Geometric sequences are created by multiplying the prior term by a constant value, called the common ratio. This common multiplication occurring at each step can be viewed as a "growth factor", similar to what can be seen in exponential growth.

3, 9, 27, 81, 243, ...

Geometric sequences demonstrate exponential growth.

Write an exponential function to model this sequence.