Name:____Date:_____________Period_________

7-1 Exploring Exponential Models

Standards

A2. F.LE.A.1 Construct linear and exponential functions, including arithmetic and geometric sequences, given a graph, a description of a relationship, or input-output pairs.
A2. F.LE.B.3 Interpret the parameters in a linear or exponential function in terms of a context.
A2.F.IF.B.3 Graph functions expressed symbolically and show key features of the graph, by hand and using technology. a. Graph square root, cube root, and piecewise defined functions, including step functions and absolute value functions. c. Graph exponential and logarithmic functions, showing intercepts and end behavior.
A2.F.IF.B.5 Compare properties of two functions each represented in a different way
A2. F.IF.A.2 Calculate and interpret the average rate of change of a function (presented symbolically) Estimate the rate of change from a graph.
A2.A.REI.D.6 Explain why the x-coordinates of the points where the graphs of the equations y = f(*x*) and y = g(*x*) intersect are the solutions of the equation f(*x*) = g(*x*); find the approximate solutions using technology. Include cases where f(*x*) and/or g(*x*) are linear, polynomial, rational, absolute value, exponential, and logarithmic functions.
A2.F.BF.B.3 Identify the effect on the graph of replacing f(*x*) by f(*x*) + *k*, *k* f(*x*), f(*kx*), and f(*x* + *k*) for specific values of k; find the value of *k* given the graphs. Experiment with cases and illustrate an explanation of the effects on the graph using technology.

Key Concepts

Characteristics	$y = ab^x$	$y = ab^{x-h} + k$
Asymptote		
Domain		
Range		

______________________________________- a function with the general form $y = ab^x$, where *x* is a real number, a ≠ 0, **b = 1 + r**, b > 0, and b ≠ 0.

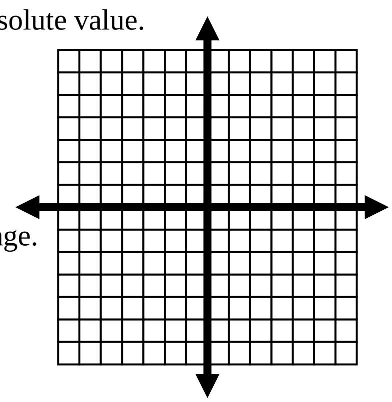
A __________________________is when b > 1 and a ________________________ is when 0 < b < 1.

________________________- a line that a graph approaches as *x* or *y* increases in absolute value.

________________________-model for exponential growth and decay.

Examples

1. (I do) Graph $y = 3(2)^x$. Identify the y-intercept, asymptote, domain and range.



2. Without graphing, determine whether the functions represent exponential growth or decay.
   a. (I do) $y = 3(\frac{2}{3})^x$
   b. (We do) $y = 0.25(2)^x$
   c. (We do) You invest $1000 into a college savings account for 4 years, the account pays 5% interest annually.

3. (They do) You invested $1000 in a savings account at the end of 6^{th} grade. The account pays 5% annual interest. How much money will be in the account at the end of 12^{th} grade?

4. (They do) The population of the Iberian lynx is 150 in 2003 and is 120 in 2004. If this trend continues and the population is decreasing exponentially, how many Iberian lynx will there be in 2014?

(You do) Practice 7-1: Complete your assignment on a separate sheet of paper. Show all work.

1. Graph $y = 0.75(4)^x$. State the y-intercept, asymptote, domain and range.
2. Explain how you know whether a function of the form $y = ab^x$ is exponential growth or decay?
3. Without graphing, determine whether the function represents exponential growth or decay. Then state the y-intercept.
   a. $y = 10(0.45)^x$ b. $y = 2(3)^x$
4. Identify each equation as linear, quadratic, or exponential.
   a. $y = 3(x + 1)^2$ b. $y = 4(3)^x$ c. $y = 2x + 5$ d. $y = 4(0.2)^x$
5. The population of Bainsville is 2000. The population is supposed to grow by 10% each year for the next 5 years. How many people will live in Bainsville in 5 years?
6. A music store sold 200 guitars in 2007. The store sold 180 guitars in 2008. The number of guitars that the store sells is decreasing exponentially. If this trend continues, how many guitars will the store sell in 2012?