Name:_____ Hour: _____ Date: _____

NOTES: Section 7.2 – Graph Exponential Decay Functions

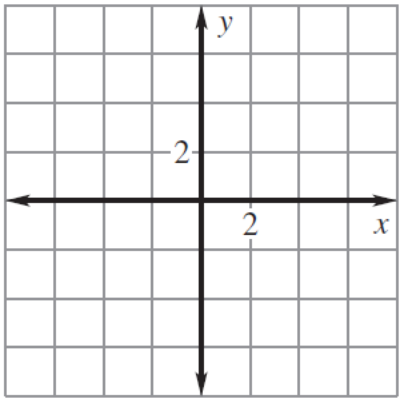
Goals: #1 - I can graph exponential decay functions and state the domain and range.

#2 - I can use an exponential decay model in a real life situation.

Homework: Lesson 7.2 Worksheet

Warm Up:

1. $f(x) = 3 \bullet 2^{x-2} - 1$



domain: _____

range: _____

2. You deposit $1500 into an account that pays 3% annual interest compounded daily. What will be the balance in your account after 1 year?

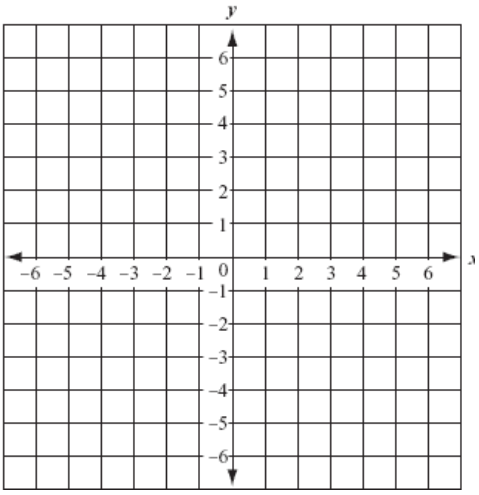
3. In 1992, 1219 parakeets were observed in the United States. For the next 11 years, about 12% more parakeets were observed each year. Write an exponential growth model for the number of parakeets observed in the U.S. since 1992.

Exploration #1: Work with a partner and answer the following questions.

1. Complete the table of vaules to graph the following function.

$y = \left(\frac{1}{2}\right)^x$

x	y
-2	
-1	
0	
1	
2	



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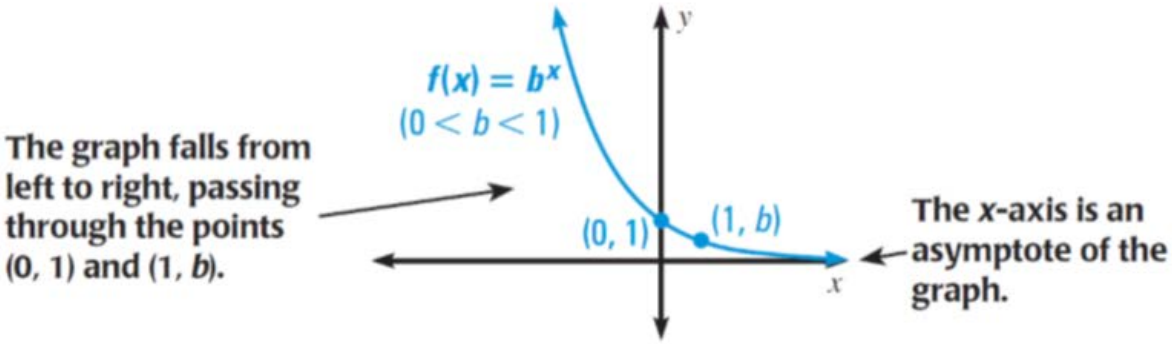
Notes:

An _____ function has the form:

where $a \neq 0$ and the base b is a positive number other than 1.

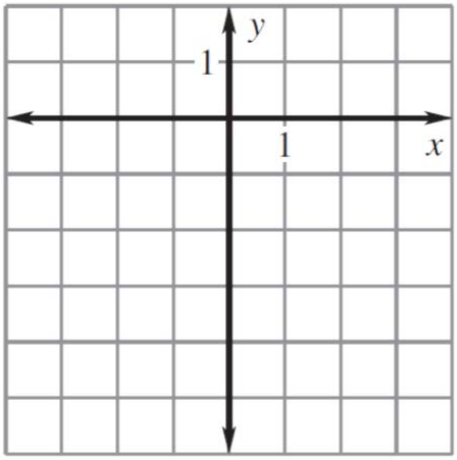
If _____, then the exponential function is an _____.



$$y = a \cdot b^x$$

Example #1: Graph the function. Then state the domain and range.

1. $y = -2\left(\frac{3}{4}\right)^x$



domain: _____

range: _____

Example #2: Tell whether the function represents *exponential growth* or *exponential decay*.

1. $f(x) = 3\left(\frac{3}{4}\right)^x$

2. $f(x) = -4\left(\frac{5}{2}\right)^x$

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Notes:

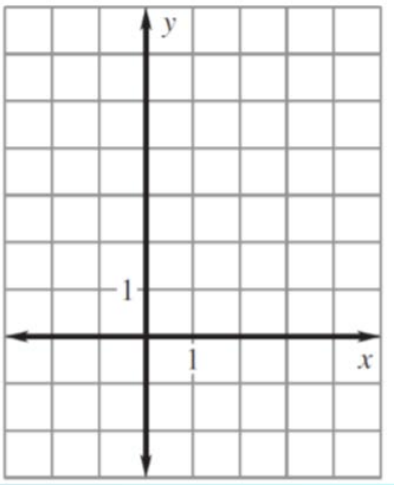
To graph a function of the form $y = a \cdot b^{x-h} + k$, begin by sketching the graph of _____.

Then translate the graph _____ by _____ units and

_____ by _____ units.

Example #3: Graph the function. Then state the domain and range.

1. $y = 2\left(\frac{3}{5}\right)^{x-1} + 1$

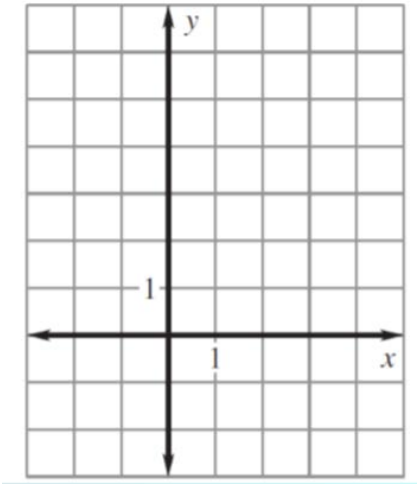


domain: _____

range: _____

You practice: Graph the function. Then state the domain and range.

1. $y = 3\left(\frac{1}{2}\right)^{x+1} - 2$



domain: _____

range: _____

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Notes:

When a real-life quantity _____ by a fixed _____ each year (or other time period), the amount y of the quantity after t years can be modeled by the equation

$$y = a(1 - r)^t$$

Example #4: A new television costs $1200. The value of the television decreases by 21% each year.

1. Write an exponential decay model giving the television's value y (in dollars) after t years.

2. Estimate the value of the television after 2 years.

3. Graph the model. Use the graph to estimate the year when the value of the television will be $300.