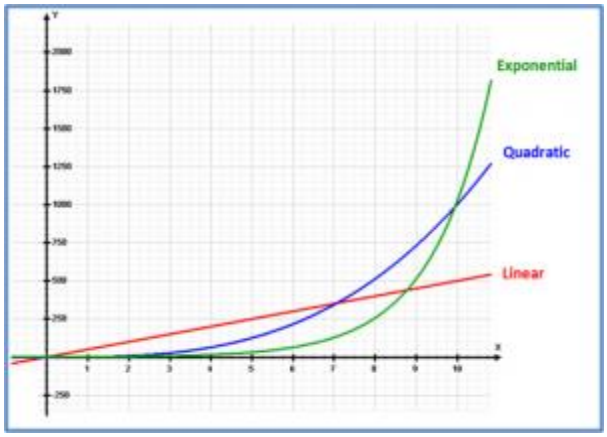
MATH 125 NAME_____ Section_____

TURN IN ALL PAGES COMPLETED FOR HOMEWORK SCORE!

16.X – EXPONENTIAL Regression



Source: http://www.synchronata.com/

Determining linear growth can be easy. However, looking at exponential growth versus quadratic patterns can be difficult without doing some analysis.

By looking at the regression value we can determine the better line even though many experts debate the validity of r-values when it comes to non-linear regression.

For more on this follow the link below:

http://blog.minitab.com/blog/adventures-in-statistics/

http://blog.minitab.com/blog/adventures-in-statistics/why-is-there-no-r-squared-for-nonlinear-regression

Example 1:

The following shows the world population. Source: www.glencoe.com

Year	1650	1750	1850	1900	1950	2000
n (billions)	.55	.73	1.18	1.6	2.56	6.08

Using your calculator, can find the standard form of the exponential y = _____
Round to the nearest tenth.

Make an appropriate graph below. Use your table to label a dot for each mark along the x-axis. Label x and y-axis appropriately. Draw a rough sketch of the points in the table AND the line.

Using the calculator, estimate the number of people in the year 2020.

2020 _____

Using the equation above, find the year (to the nearest tenth) when the population will hit 10 billion.

10 billion _____

Using your calculator, can find the standard form of the quadratic y = _____
Round to the nearest tenth.

Comparing the two the r-values. Which graph would be the better fit and why?

_____

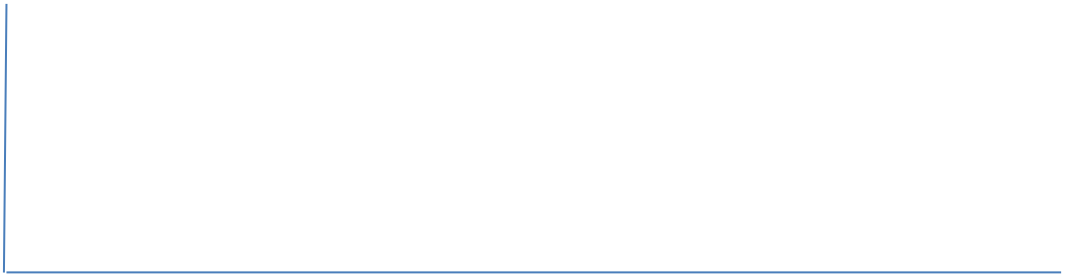
Example 2:

The following shows the decline bee population. Source: USDA (United States Department of Agriculture) and NASS (National Agricultural Statistical Service)

Year	1982	1987	1992	1997	2002	2007
Colonies (millions)	4.4	3.3	3.1	2.6	2.5	2.4

Using your calculator, can find the standard form of the exponential y = _____
Round to the nearest tenth.

Make an appropriate graph below. Use your table to label a dot for each mark along the x-axis. Label x and y-axis appropriately. Draw a rough sketch of the points in the table AND the line.



Using the calculator, estimate the number of bees in the year 2020.

2020 _____

Using the equation above, find the year (to the nearest tenth) when bees colonies will decline to 1million.

1 million _____

Using your calculator, can find the standard form of the quadratic y = _____
Round to the nearest tenth.

Comparing the two the r-values. Which graph would be the better fit?

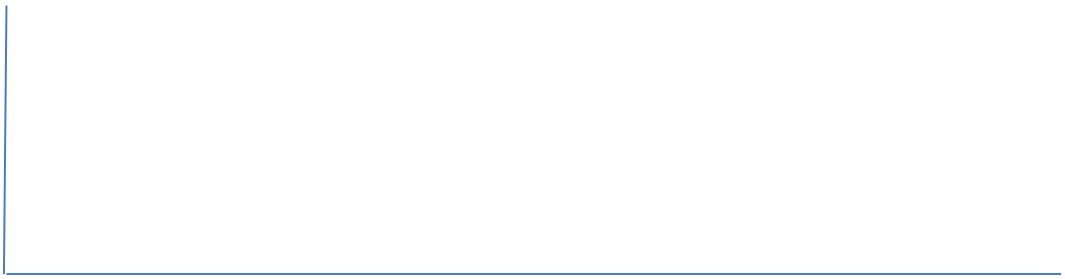
Homework problem 1:

The following shows cell phone sales.

Year	2005	2006	2007	2008	2009	2010
n (billions)	2.1	2.9	3.4	4.1	4.5	5.2

Using your calculator, can find the standard form of the exponential y = _____
Round to the nearest tenth.

Make an appropriate graph below. Use your table to label a dot for each mark along the x-axis. Label x and y-axis appropriately. Draw a rough sketch of the points in the table AND the line.



Using the calculator, estimate the number of sales in the year 2020.

2020 _____

Using the equation above, find the year (to the nearest tenth) when cell phone unit sales will hit 15 billion.

15 billion _____

Using your calculator, can find the standard form of the quadratic y = _____
Round to the nearest tenth.

Comparing the two the r-values. Which graph would be the better fit and why?

_____

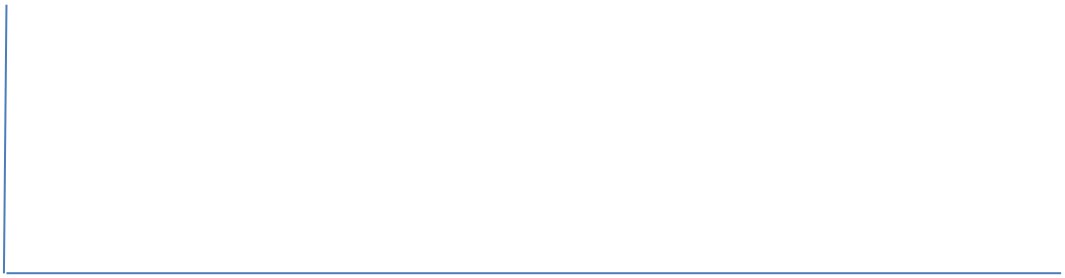
Homework problem 2:

The following shows the decline of aspirin in the body over time.

Time	0	10	20	30	40	50
# of molecules	50	23	10	6	2	1

Using your calculator, find the standard form of the exponential y = _____
Round to the nearest tenth.

Make an appropriate graph below. Use your table to label a dot for each mark along the x-axis. Label x and y-axis appropriately. Draw a rough sketch of the points in the table AND the line.



Using the calculator, estimate the number of molecules at 15 minutes.

15 _____

Using the equation above, find the time (to the nearest tenth) when you will have 40 molecules in your body.

40 _____

Using your calculator, find the standard form of the quadratic y = _____
Round to the nearest tenth.

Comparing the two r-values. Which graph would be the better fit and why?
