GRED 534 – Fall 2008 **Assignment 5** **Graphing Calculator Activities**

Following are eight graphing calculator exercises. Complete each of the eight activities, and answer each question as completely as possible.

Point Values:

Monopoly lab	5 points	
Numerical investigations	20 points	(*4 points each*)
Regents questions	12 points	(*6 points each*)
Total	**37 points**	

Monopoly© Lab

Using a standard Monopoly board, consider all the properties that can be acquired by purchasing a mortgage, and list them from 1 to 28 (*this list is shown below*).

X (*L1*)	*Property Name*	*Y* (*L2*) *Property Price*
1	Mediterranean Ave.	$ 60
2	Baltic Ave.	$ 60
3	Reading Railroad	$ 200
4	Oriental Ave.	$ 100
5	Vermont Ave.	$ 100
6	Connecticut Ave.	$ 120
7	St. Charles Plave	$ 140
8	Electric Company	$ 150
9	States Ave.	$ 140
10	Virginia Ave.	$ 160
11	Pennsylvania Railroad	$ 200
12	St. James Place	$ 180
13	Tennessee Ave.	$ 180
14	New York Ave.	$ 200
15	Kentucky Ave.	$ 220
16	Indiana Ave.	$ 220
17	Illinois Ave.	$ 240
18	B. & O. Railroad	$ 200
19	Atlantic Ave.	$ 260
20	Ventnor Ave.	$ 260
21	Water Works	$ 75
22	Marvin Gardens	$ 280
23	Pacific Ave.	$ 300
24	North Carolina Ave.	$ 300
25	Pennsylvania Ave.	$ 320
26	Short Line Railroad	$ 200
27	Park Place	$ 350
28	Boardwalk	$ 400

1. Create a scatterplot and sketch it.
2. Does the data appear to be a linear relationship? Perform a linear regression. What formula does it give for the line of best fit? What is the correlation coefficient *r*?
3. What about those railroads? Might they be considered outliers? Why or why not?
4. Remove the railroads from the data set. Recalculate the regression. How does the strength of the correlation coefficient change?
5. Suppose a new property was added to the board following Boardwalk (in future editions of *Monopoly*©). What price does the regression analysis suggest that its value should be (to the *nearest ten dollars*)?

Investigating Numerical Data
Mathematical Modeling using Regression Equations

Goals:
1) create a scatterplot for the data
2) create an equation that represents the data
3) graph the equation and show that it models the data

Consider the following data:

Problem 1

x	*y*	*Differences (use if needed)*
0	2	
0.5	2.25	
1	2.5	
1.5	2.75	
2	3	
2.5	3.25	
3	3.5	

a. What kind of equation will best model this data?

b. Why?

c. Use your graphing calculator to create a scatterplot for the data.

d. Create an equation that is representative of your data and enter into the Y = menu. Graph this equation. Draw a sketch of your graph below and write the equation.

Sketch:

Problem 2

x	*y*	*Differences (use if needed)*
0	1	
0.5	0	
1	0	
1.5	1	
2	3	
2.5	6	
3	10	

e. What kind of equation will best model this data?

f. Why?

g. Use your graphing calculator and create a scatterplot for the data.

h. Create an equation that is representative of your data and enter into the Y = menu. Graph that equation. Draw a sketch of the graph below and write the equation.

Sketch:

Problem 3

x	*y*	*Differences (use if needed)*
0	1	
0.5	1.41421	
1	2	
1.5	2.82842	
2	4	
2.5	5.65685	
3	8	

i. What kind of equation will best model this data?

j. Why?

k. Use your graphing calculator and create a scatterplot for the data.

l. Create an equation that is representative of your data and enter into the Y = menu. Graph. Draw a sketch of your graph below and write the equation.

Sketch:

Problem 4

x	*y*	*Differences (use if needed)*
0	1	
0.5	0.7071	
1	0.5	
1.5	0.35355	
2	0.25	
2.5	0.17678	
3	0.125	

m. What kind of equation will best model this data?

n. Why?

o. Use your graphing calculator and create a scatterplot for the data.

p. Create an equation that is representative of your data and enter into the Y = menu. Graph. Draw a sketch of your graph below and write the equation.

Sketch:

Problem 5

x	*y*	*Differences (use if needed)*
0	0	
0.5	0.7071	
1	1	
1.5	1.2247	
2	1.4142	
2.5	1.5811	
3	1.732	

q. What kind of equation will best model the data?

r. Why?

s. Use your graphing calculator and create a scatterplot for the data.

t. Create an equation that is representative of your data and enter into the Y = menu. Graph. Draw a sketch if your graph below and write the equation.

Sketch:

Regents Problem 1

The accompanying table illustrates the number of movie theaters showing a popular film and the film's weekly gross earnings, in millions of dollars.

Number of Theaters (*x*)	443	455	493	530	569	657	723	1,064
Gross Earnings (*y*) (millions of dollars)	2.57	2.65	3.73	4.05	4.76	4.76	5.15	9.35

Write the linear regression equation for this set of data, rounding values to *five decimal places*.

Using this linear regression equation, find the approximate gross earnings, in millions of dollars, generated by 610 theaters. Round your answer to *two decimal places*.

Find the minimum number of theaters that would generate at least 7.65 million dollars in gross earnings in one week.

Regents Problem 2

Naturally, I'd like you to make use of a graphing calculator to do this problem! ☺

The members of the Lincoln High School Prom Committee are trying to raise money for their senior prom. They plan to sell teddy bears. The senior advisor told them that the profit equation for their project is $y = -0.1x^2 + 9x - 50$, where x is the price at which the teddy bears will be sold and y is the profit, in dollars.

On the graph grid below, graph this relationship so that $0 \le x \le 90$ and $-50 \le y \le 160$.

How much profit can the committee expect to make if they sell the teddy bears for $20 each?

What price should they charge for the teddy bears to make the maximum profit possible?