National Debt (40 points)

Due November 30

In this project you will conduct research into the size of the US National Debt from 1940 to 2014. Please use only reputable websites to find data. Briefly explain what US National Debt is.

1. Organize your data in the table, where the independent variable will represent years since 1940 and the dependent variable will represent the debt of the US in trillions of dollars.

2. Use a graphing calculator to plot points. Sketch your plot. Show the window used. You can use free Geogebra software to make a "nice" graph.

3. Determine what type of graph could be used to approximate the level of U.S. National Debt over the years 1940 to 2014: linear, quadratic, cubic, exponential, or logarithmic. For each type write the equation of best fit and the correlation coefficient.

   a) Linear equation correlation_____

Y=

   b) Quadratic equation correlation_____

Y=

c) Cubic equation correlation_____

Y=

d) Exponential equation correlation_____

Y=

e) Logarithmic equation correlation_____

Y=

4. Which type of function fits this data the best? **Explain!**

5. Use your best fit model to predict the US National Debt in 2020

6. Find an equation which represents the US national debt per Us citizen

7. Use the exponential model to predict US National Debt in 2020. Explain how you found it.

8. Use the exponential equation of the best fit to predict the year when the US National Debt will reach $10,000 trillion.

9. What are some of the reasons for the national debt to increase and is it always a “bad thing”?

Grading Rubric

	Data Presentation And analysis	Graph	Models	Using Exponential Equation
8-10 points	Data is organized neatly in a table. Correct units are used Sources are mentioned Reasons for the national debt are explained clearly and impact of national is debt is explained clearly	Graph matches the data exactly. Graph is labeled. Window is clearly shown.	All 5 equations are correct, Correlation coefficients are correct The function that fits the data is chosen correctly and explanation id given	Exponential function is used to predict debt in 2020 and work is shown Exponential function is used to predict when debt reaches $10,000 trillion. Exponential equation is solved correctly and all work is shown
4-7points	Data is organized in a table. Correct units are used Sources are mentioned Reasons for the national debt are not explained clearly	Graph matches only some of the data. Graph is labeled. Window is shown	3 equations are correct, 3 correlation coefficients are correct The function that fits the data is chosen correctly, no explanation.	Exponential function is used to predict debt in 2020 Exponential function is used to predict when debt reaches $10,000 trillion. Exponential equation is not solved correctly, few mistakes are made
0-3 points	Data is organized in a table. Reasons for the national debt are not explained	Graph does not match the data. No label, no window	1 equation are correct, 1 correlation coefficients are correct The function that fits the data is chosen	Exponential function is used to predict debt in 2020 Exponential function is used to predict when debt reaches $10,000 trillion. Exponential equation is not solved correctly.