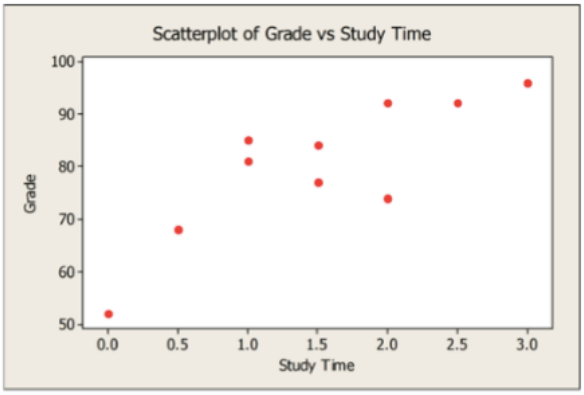
AP Statistics 1718 _____ is a model
Congress/Renazco Period:

Part II: Free Response. Only one part at a time.

1. A college teacher asked a random sample of 10 of the 250 students in her introductory statistics class to record the total amount of time (in hours) they spent studying for a particular test and then combined these times with the students' scores on the test. She then performed a regression analysis on the data. Below is numerical and graphical output from her computer software.

Predictor	Coef	SE Coef	T	P
Constant	62.100	4.893	12.69	0.000
Study Time	12.000	2.825	4.25	0.003

S = 7.73709 R-Sq = 69.3% R-Sq(adj) = 65.4%



(a) Write the Least Squares Regression Line. [4 pts]

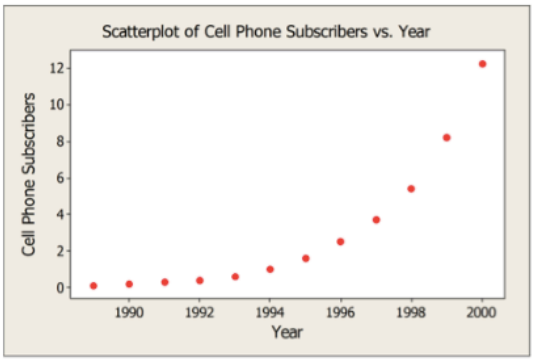
(b) Draw the LSRL on the scatterplot. [1]
(c) Make a **rough** sketch of the residual plot in the space **to the left of the scatterplot**. [1]
(d) Comment on whether the LSRL is a good fit for the scatterplot. [3]

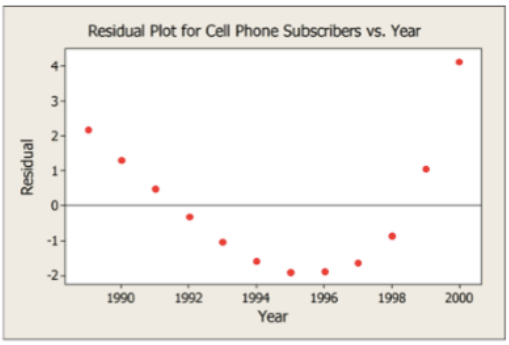
(e) Construct and interpret a 95% confidence interval for the slope of the population regression line for predicting test score from study time. **Assume all conditions have been met.** [6]

(f) Based on your interval, what can you conclude about the relationship between studying time and test score? [3]

(g) Can the teacher tell her students that studying more will improve their grades? Explain. [2]

2. Global use of cell phones grew rapidly between 1989 and 2000. Below is a scatterplot of the percentage of people in the world who are cell phone subscribers versus year for this time interval, along with the residual plot from a linear regression analysis.





(a) Is a linear model appropriate for these data? Justify your answer. [3]

(b) Below is a scatterplot of the natural logarithm of cell phone subscribers vs. year. This relationship is clearly more linear than the one above. Does this suggest that the relationship between cell phone subscribers and year can be modeled by an exponential function or by a power function? Explain. [2]