

Pledge:

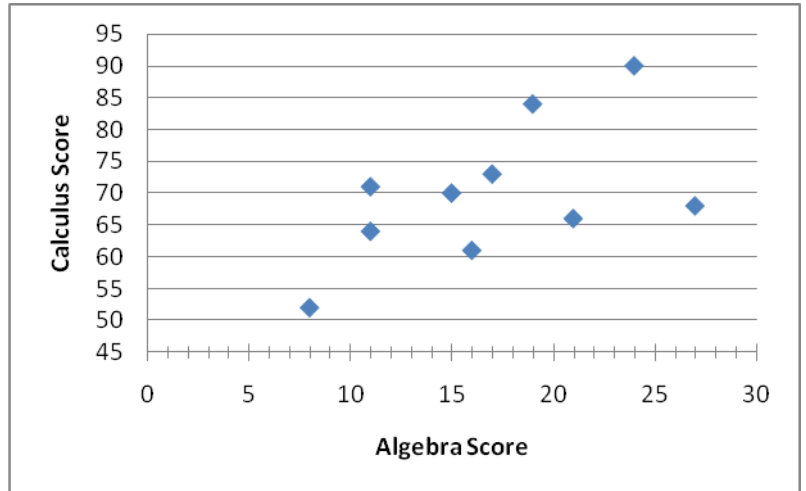
9/26/2008
Dr. Lunsford

MATH 171
Quiz 2

Name: _____
30 Points Possible

Problem I. In an observational study of the factors that are associated with success in a calculus course, data were collected for 10 different students. For each student, their score on an algebra placement test and their score on a calculus achievement test were recorded. Below are the data along with a scatterplot of the data. Please answer the following questions. (22 points total)

Algebra Score	Calculus Score
17	73
21	66
11	64
16	61
15	70
11	71
24	90
27	68
19	84
8	52



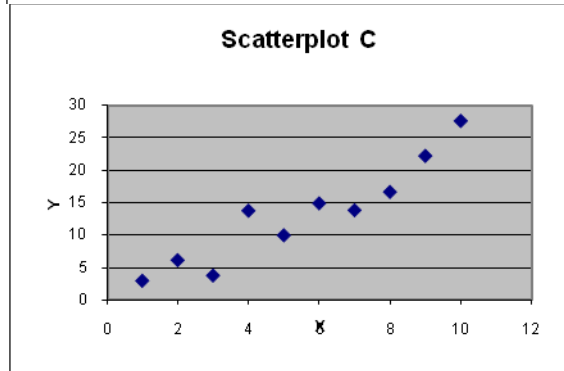
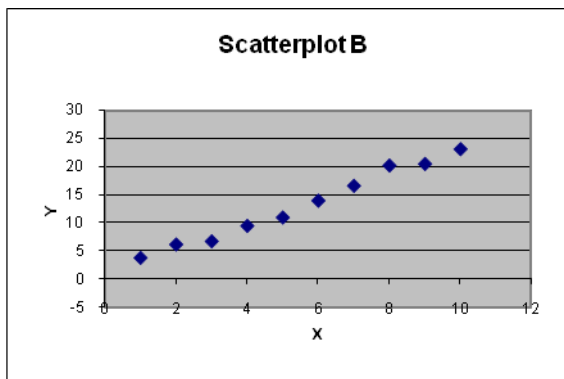
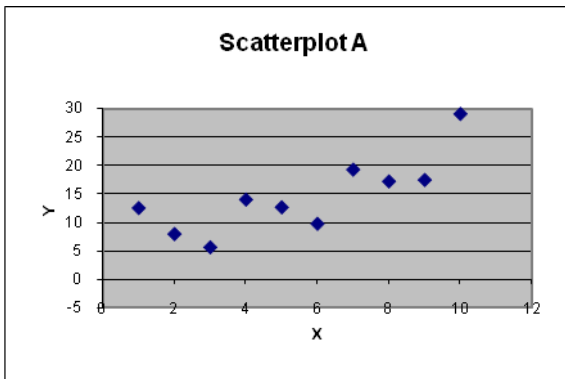
- Which variable is the explanatory variable? Which is the response variable? Clearly indicate your answers. (2 points)
- Find the centroid of the data and plot it on the scatterplot. Clearly indicate the point on the graph and give its coordinates below. (2 points)
- What is the value of the linear correlation coefficient for these data? (2 points)
- Find the equation of the least squares regression line and accurately plot it on the scatterplot. Clearly write the equation of the line below. (4 points)
- Using the regression line, for each increase of one point in algebra score, would we expect an increase or decrease in calculus score and how much of an increase or decrease would we expect? (2 points)
- Use the regression line to predict the expected calculus score for students who have an algebra score of 13. Please show all work. Show this prediction graphically on the scatterplot by drawing the “up and over” lines. (3 points)
- Find the residual for the data point (27,68). (3 points)

Problem I, continued.

(h) Do you think the least squares regression line is a good predictive model of calculus scores given algebra scores? Why or why not? (Hint: Use the coefficient of variation, r^2 , to answer this question.) (2 points)

(i) Based on this study, do you think higher algebra scores cause higher calculus scores? Why or why not? (2 points)

Problem II. Below you are given three scatterplots and three correlation coefficients. Please write the name of the scatterplot (i.e. either A, B, or C) in the blank next to the correlation coefficient for the scatterplot. (2 points each – 6 points total)



$r = 0.785293$ _____

$r = 0.94104$ _____

$r = 0.993153$ _____

Problem III. The Nurses Health Study has interviewed a sample of more than 100,000 female registered nurses every two years since 1976. The study finds that “light-to-moderate drinkers had a significantly lower risk of death” than either nondrinkers or heavy drinkers. The Nurses’ Health Study is (circle one) (2 points)

an observational study

an experiment

can’t tell without more information