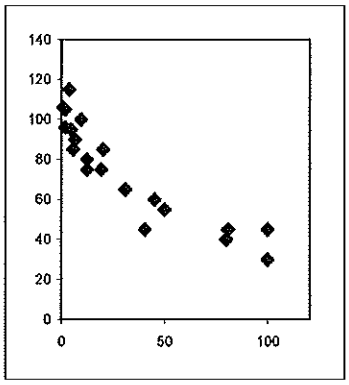
STA 200 Chapter 14 Exercise 1

Match the following graphs with these correlations:

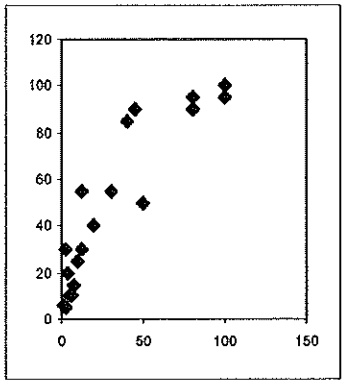
r = -.99 r = -.70 r = -.30 r = 0 r = .50 r = .90

1.



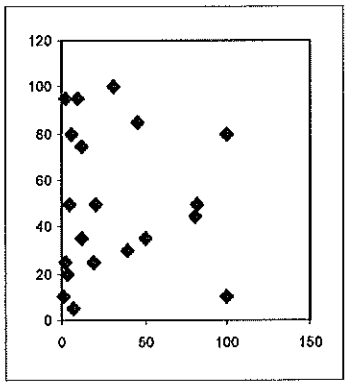
r = -.99

2.



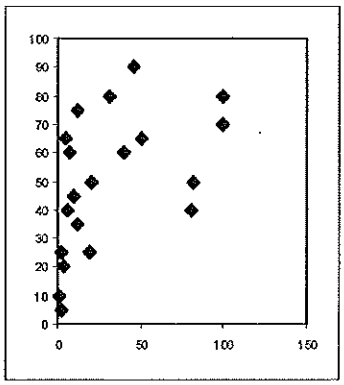
r = .9

3.



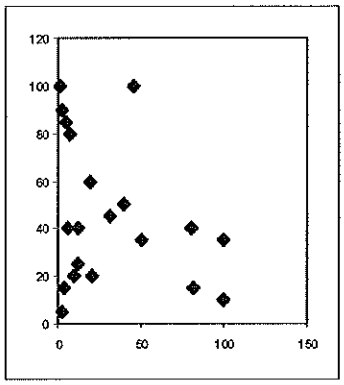
r = 0

4.



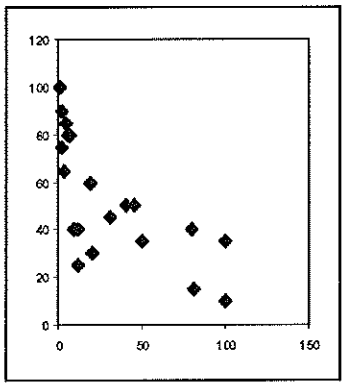
r = .5

5.



r = -.3

6.

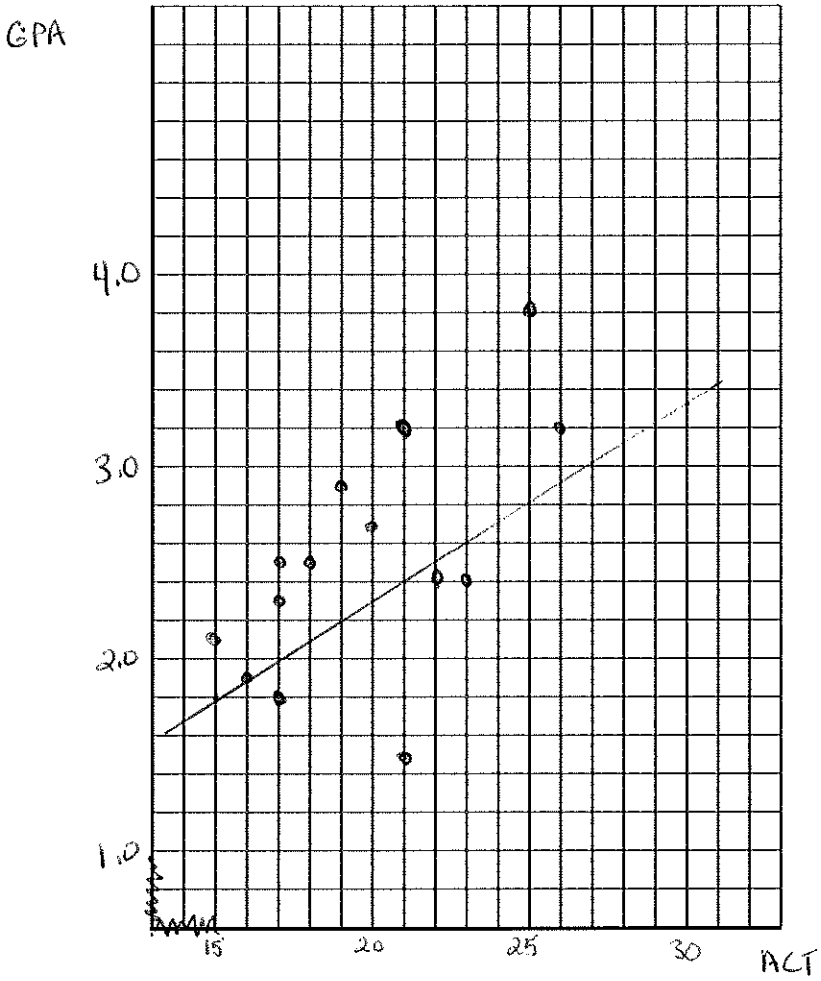


r = -.7

STA 200 Chapter 15 Exercise 2

The following list shows the ACT scores and the first semester GPA's for 15 college students.

ACT Score	GPA
21	3.2
18	2.5
15	2.1
17	1.8
18	2.2
25	3.8
22	2.4
16	1.9
19	2.9
17	2.5
26	3.2
23	2.4
20	2.7
17	2.3
21	1.5



1. Draw a scatterplot of the data using the grid above.

2. The correlation coefficient is r = .62. Explain why this is reasonable based on the scatterplot you drew.
dots are generally positive sloping & somewhat in a straight line pattern.

3. The regression equation is GPA = .3 + .1(ACT)
   a) Draw this line on your scatterplot.

   b) Interpret the intercept in this equation.
ACT scores of 0 would have predicted .3 GPA (but issue of extrapolation)

   c) Interpret the slope in this equation.
when ACT increases by 1, GPA increases by .1

   d) What GPA would you predict for a student with an ACT of 20?

GPA(20) = .3 + .1(20) = 2.3

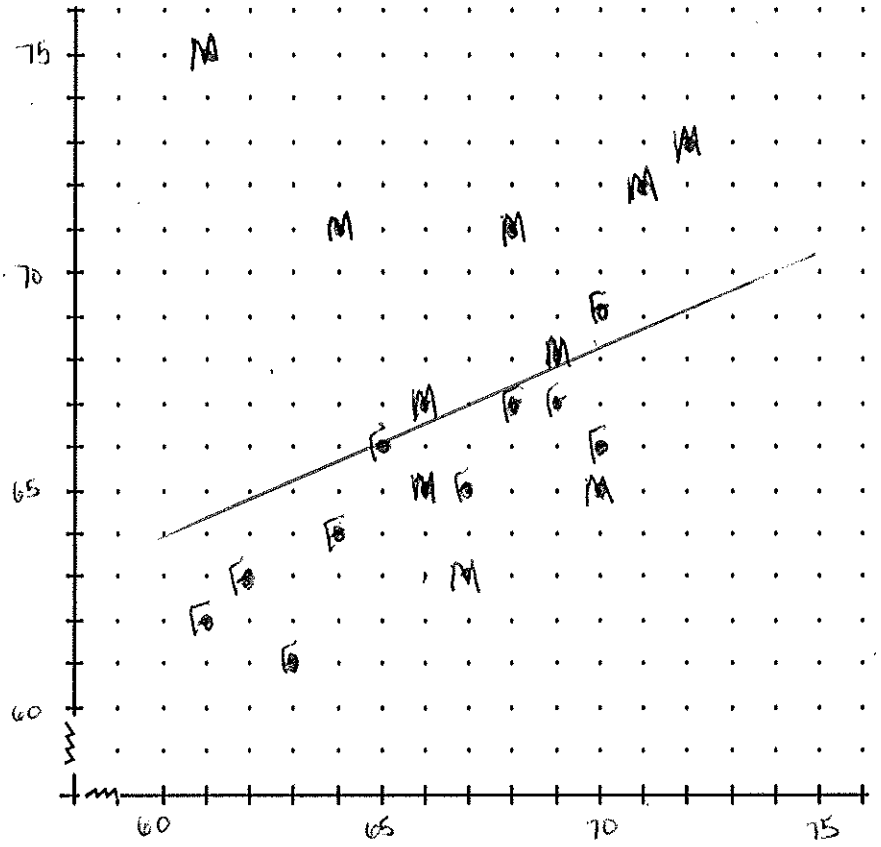
STA 200 NAME_____
Exercise 3

The purpose of this activity is for you to compute and interpret some measures of the relationship between two variables.

1. In the relationship between student height and parent average height, which variable is the explanatory variable and which is the response variable?

exp var = parent height
res var = student height

2. Draw a scatter plot of the data. Use the horizontal axis for the explanatory variable and the vertical axis for the response variable. Use different colors for males and females. Remember to label the axes and mark the scale on the axes.



3. To interpret the scatterplot, answer the following questions.

a) Overall, does the association appear to be linear? If it appears linear, is it positive or negative or zero?

linear positive

b) Write a statement about how students' heights change based on parents' average height. (For example, in describing the relationship between height and weight, one might say that as a person's height increases their weight tends to increase.)

taller than average parents tend to have taller than average kids

c) Which point could be identified as an outlier? Explain the characteristics of the student who corresponds to this point.

(61, 75) b/c short parents have tall kid

d) Now look only at the data points corresponding to female students. Does the association appear to be linear? If it appears linear, is it positive or negative or zero?

linear positive

e) Now look only at the data about males. Does the association appear to be linear? If it appears linear, is it positive or negative or zero?

linear & closer to 0

4. The equation of the regression line for this data is:

Student Height = 42.601 + .365 • Parent Average Height

a) Sketch this line on your scatterplot.

b) What is the intercept? Does it have a logical meaning in this example? If yes, what is it? If no, explain why not?

intercept is 42.601
no logical since that means people with parents 0 feet tall are 42.601 inches

c) What is the slope? Explain what this slope means in terms of this example.

.365 means as parent height increases 1 inch, childs height is .365 taller on average

d) Predict the height of a student whose parents' average height is 62 inches.

StudHeight(62) = 42.601 + .365(62) = 65.231

e) Compare your prediction to the height for the student in the sample whose parents' average height was 62 inches. How far is your prediction from the actual student's height?

in data 62 has kid 63".
2.231 inches different.

BONUS - Look at the scatterplot you drew in problem 2. The correlation coefficients for the following three pairs of variables are -.15, .32, and .88. Match the correlation coefficient to the correct relationship.

A. Overall Student Height and Parents' Height r = .32

B. Female Student Height and Parents' Height r = .88

C. Male Student Height and Parents' Height r = -.15

Now explain why you made your choice. (You only need to justify how you identified two of the three numbers.)

B. b/c F marks are sloping positive & close to straight line

C Males correlation is close to 0

STA 200 Data for Group Activity 4

A simple random sample of 20 college students included 10 females and 10 males. Each student was asked to list their own height and the heights of their mother and father. The heights of their parents were averaged to calculate a new variable called Parent Average Height.

Student Sex	Parent Average Height (in inches)	Student Height (in inches)
F	63	61
F	65	66
F	67	65
F	70	66
F	68	67
F	61	62
F	70	69
F	62	63
F	64	64
F	69	67
M	64	71
M	68	71
M	72	73
M	66	67
M	66	65
M	71	72
M	69	68
M	61	75
M	67	63
M	70	65