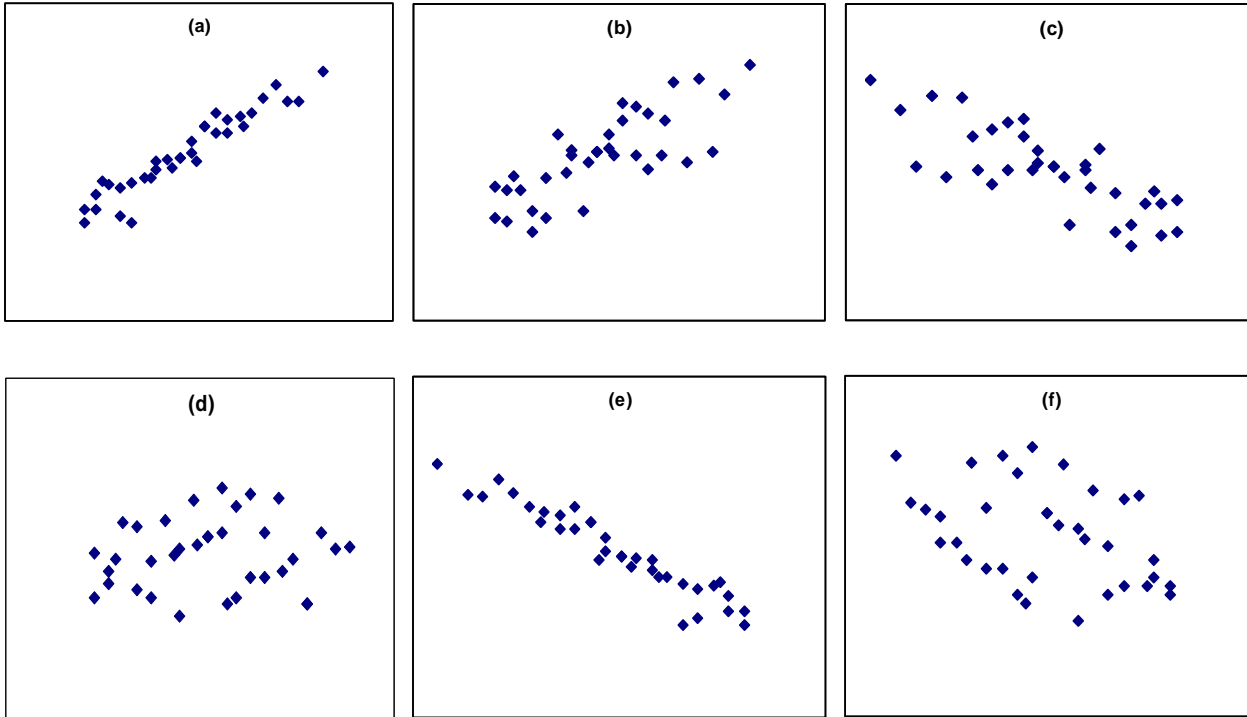STAT 108   EXERCISES ON CORRELATION COEFFICIENT

Exercise 1. Match each of the r's below that best describes the pattern on each of the six scatter diagrams. $r = $ -0.9, -0.7, -0.3, 0, 0.3, 0.7, 0.9.
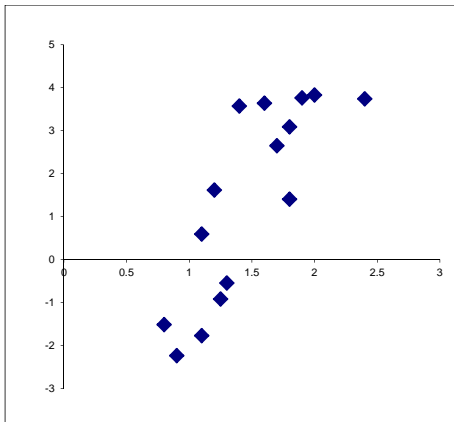

Exercise 2. Match the answers with the statements. The answers in scrambled order are $r = 0.2$, $r = 0.5$, and $r = 0.8$. Measurements in large samples show that the correlation

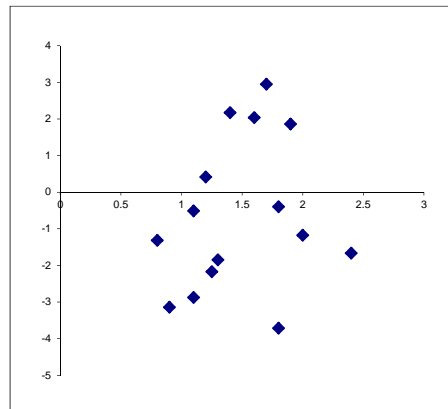(a) between father's height and son's adult height is about _____,

(b) between husband's height and wife's height is about _____,

(c) between a male's height at age 4 and his height at age 18 is about _____.
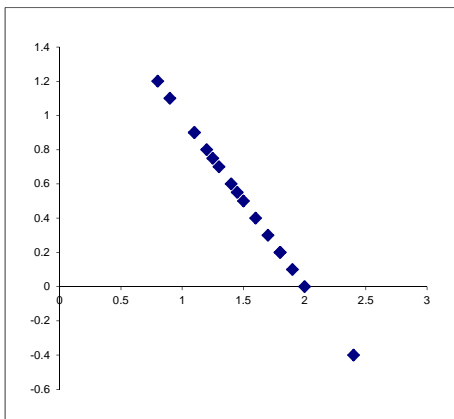
Exercise 3. Describe the form, direction and strength of the relationship on each of the following scatter diagrams.
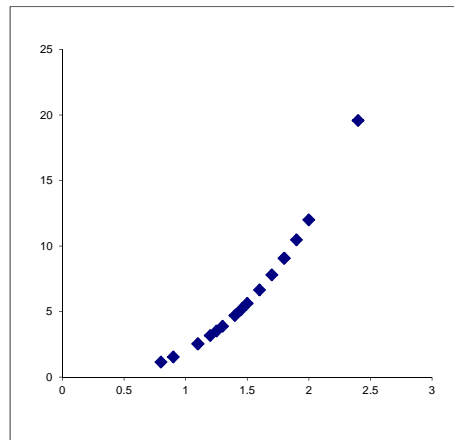

$$r = 0.82$$

$$r = 0.21$$

$$r = \underline{\qquad}$$

$$r = 0.97$$

Exercise 4. Which of the following statements are NOT CORRECT?

(a) The value of linear correlation coefficient r is always between -1 and +1.
(b) If there is a positive correlation between two variables X and Y, then r is positive.
(c) Two variables X and Y exhibit a negative correlation if and only if $r = -1$.
(d) A correlation coefficient close to zero indicates that the points on the scatter diagram are not clustered around any sloped straight line.
(e) The correlation coefficient for two variables X and Y such that $Y=X^2$ is equal to 1.

Exercise 5. For which data set the correlation coefficient is most likely positive, negative, equal to zero?

(a) height and weight of children from ages 4 to 12 years
(b) time spent at work and time spent with the family per day
(c) time spent studying for an exam and score on that exam
(d) weight and city MPG of automobiles
(e) toe length and IQ
(f) number of beers drank and number of push-ups per minute

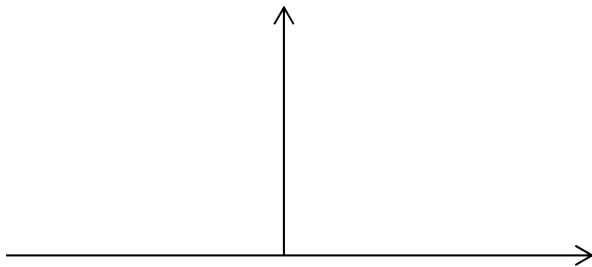
Exercise 6. (a) Compute the correlation coefficient for the points (-5,0), (-3, 4), (0, 5), (3, 4), and (5,0).

$$\sum xy =$$

$$\bar{x} = \frac{}{5} =$$

$$r =$$

(b) Plot the points on a scatter diagram.

(c) Describe the pattern you see on the scatter diagram.

(d) Explain how it can happen that for a perfect relationship seen on the scatter diagram the correlation coefficient is equal to zero.