

Review for CHAPTER 4 TEST

Name: Key

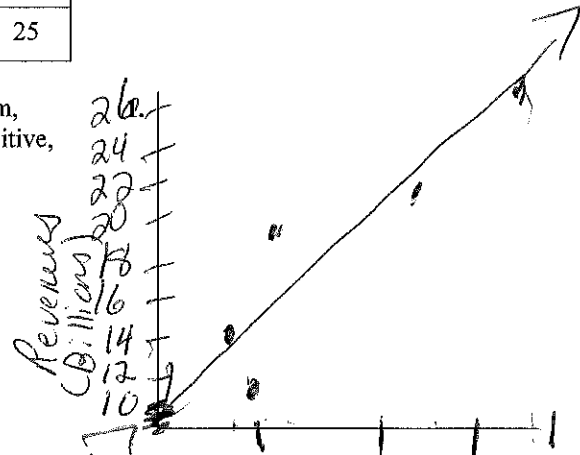
For the given data, solve the following problems.

Do higher paid chief executive officers control bigger companies? Here, x = annual CEO salary (\$ millions) and y = annual company revenue (\$ billions). The following data are based on information from *Forbes* magazine and represents a sample of top US executives.

x (\$ millions)	0.8	1.0	1.1	1.7	2.3
y (\$ billions)	14	11	19	20	25

1. Create a scatter diagram. Using only the scatter diagram, would you estimate the correlation coefficient to be positive, close to zero, or negative? Explain your answer.

Positive as x increases
 y increases



2. For the given data compute each of the following.

(a) \bar{x} and \bar{y}

(b) $\sum x, \sum y, \sum x^2, \sum y^2, \sum xy$

- (c) The slope b and y -intercept a of the least squares line; write out the equation for the least squares line.

- (d) Graph the least squares line on your scatter plot from problem 1.

2. (a) $\bar{x} = 1.38$ $\bar{y} = 17.8$ Salary (millions)
 (b) $\sum x = 6.9$ $\sum y = 89$ $\sum x^2 = 11.03$
 Slope: $b = 7.81$ $\sum y^2 = 1703$
 (c) y -int: $a = 7.02$ $\sum xy = 154.6$
 $y = 7.81x + 7.02$
 (d)

3. Compute the

(a) sample correlation coefficient r .

(b) coefficient of determination.

- (c) Give a brief explanation of the meaning of the coefficient

of determination in the context of this problem.

3. (a) $r = .880$

(b) $r^2 = .775 \approx 77.5\%$

(c) _____

77.5% of higher paid executives control billion dollar companies, where 22.5% can be caused by a leading variables

4. If a CEO has an annual salary of \$1.5 million, what is his or her annual company revenue as predicted by the least squares line?

4. $y = 7.81(1.5) + 7.02$
 $y = 18.74$ Billion
 Interpolation

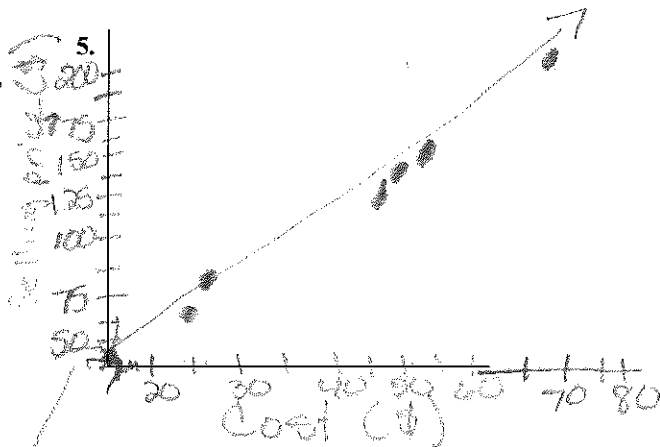
For the given data, solve the following problems.

An accountant for a small manufacturing plant collected the following random sample to study the relationship between x = the cost to make a particular item and y = the selling price.

x (\$)	26	50	47	23	52	71
y (\$)	78	132	128	70	152	198

5. Create a scatter diagram. Using only the scatter diagram, would you estimate the correlation coefficient to be positive, close to zero, or negative? Explain your answer.

Positive as x increases so does y .



6. For the given data compute each of the following.

- (a) \bar{x} and \bar{y}
 (b) $\sum x$, $\sum y$, $\sum x^2$, $\sum y^2$, $\sum xy$
 (c) The slope b and y -intercept a of the least squares line; write out the equation for the least squares line.
 (d) Graph the least squares line on your scatter plot of problem 5.

6. (a) $\bar{x} = 44.83$ $\bar{y} = 126.3$
 (b) $\sum x = 269$ $\sum x^2 = 13,659$ $\sum y = 758$
 $\sum y^2 = 107,100$ $\sum xy = 38,216$
 (c) $y = 2.6471x + 7.16$

7. Compute the
 (a) sample correlation coefficient r .
 (b) coefficient of determination.
 (c) Give a brief explanation of the meaning of the coefficient of determination in the context of this problem.

$b = \frac{6 \cdot 38,216 - (269)(758)}{6(13,659) - (269)^2} = \frac{25,384}{9,593} = 2.6471$ $a = 126.3 - (2.6471)(44.83) = 7.16$

7. (a) $r = 0.994$
 (b) $r^2 = .988 \approx 98.8\%$

98.8% of the cost to make an item causes the price of the item. While only 1.2% could be caused by a lurking variable.

8. Suppose that the cost to make a particular item is \$35. What does the least-squares line predict as the selling price?

8. $y = 2.6471(35) + 7.16 \approx 100$
 Interpolation