

Elementary Statistics

Name: \_\_\_\_\_

Study Guide 31

Class: \_\_\_\_\_

Due Date: \_\_\_\_\_

Score: \_\_\_\_\_

**Your solutions must be consistent with class notes & resources.**

Be Neat, Organized, and No Work  $\Leftrightarrow$  No Points

1. Consider the following points below:

(2, 14), (6, 12), (6, 3), (8, 5), (14, 4), (18, 6), (18, 8), (20, 2)

(a) (2 points) Find the value of the correlation coefficient  $r$ .

(a) \_\_\_\_\_

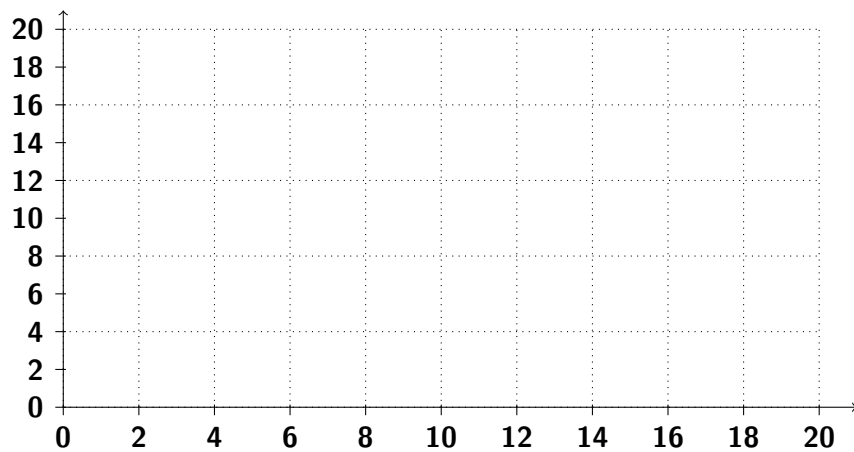
(b) (2 points) Find the value of the coefficient of determination  $r^2$  to the nearest percentage.

(b) \_\_\_\_\_

(c) (2 points) Find the equation of the regression line.

(c) \_\_\_\_\_

(d) (3 points) Plot each point and draw the regression line below.



2. The study time and the exam result for a random sample of 12 students in an elementary statistics course are shown in the following table.

Study Time	4	8	5	8	6	9	9	7	4	7	6	5
Exam Result	68	85	75	75	95	90	70	80	65	72	95	85

Table 1:  
Study Time & Exam Result

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- (a) (2 points) Find the value of the correlation coefficient  $r$ .

(a) \_\_\_\_\_

- (b) (2 points) Find the value of the coefficient of determination  $r^2$  to the nearest percentage and explain what the value means in the case.

(b) \_\_\_\_\_

- (c) (2 points) Find the equation of the regression line.

(c) \_\_\_\_\_

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At  $\alpha = 0.05$  level of significance, determine whether the correlation coefficient  $r$  is strong enough to conclude that the study time and the exam result are linearly correlated by using the data in table 1.

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- (d) (4 points) Clearly state  $H_0$  and  $H_1$ . State what each means in this problem.

$H_0$  : \_\_\_\_\_

$H_1$  : \_\_\_\_\_

- (e) (3 points) Find the computed test statistic and the  $p$ -value.  
You must name TI command used.

C.T.S. : \_\_\_\_\_

$p$ -Value : \_\_\_\_\_

(f) (2 points) Use the P-value method to determine whether the given linear correlation is significant or not.

(f) \_\_\_\_\_

(g) (3 points) Based on your conclusion, predict an exam result for a student whose study time was 6.5 hours.

(g) \_\_\_\_\_

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3. (4 points) Given:  $n = 12$ ,  $r = -0.605$ , and a significance level of 0.02, determine whether the given linear correlation is significant or not.

3. \_\_\_\_\_

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4. (4 points) Given:  $n = 5$ ,  $r = 0.844$ , and a significance level of 0.01, determine whether the given linear correlation is significant or not.

4. \_\_\_\_\_

5. (5 points) Eight pairs of data yield  $r = 0.708$ , and the regression equation  $y = 58 + 3x$  with  $\bar{y} = 71.5$ . At significance level of 0.10, What is the best predicted value for  $y$  for  $x = 5$ ?

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5. \_\_\_\_\_

6. (5 points) Six pairs of data yield  $r = -0.789$ , and the regression equation  $y = 66 - 4x$  with  $\bar{y} = 54.5$ . At significance level of 0.04, What is the best predicted value for  $y$  for  $x = 4$ ?

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6. \_\_\_\_\_

7. (5 points) Eight pairs of data yield  $r = -0.875$ , and the regression equation  $y = 28 - 4.5x$  with  $\bar{y} = 7.5$ . At significance level of 0.1, What is the best predicted value for  $y$  for  $x = 4$ ?

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7. \_\_\_\_\_

*Learning has never been achieved without errors.*