

**PRAYER BEFORE TEST:**

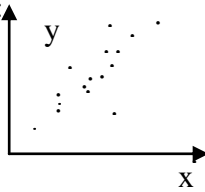
Holy Spirit, You enlighten our hearts and minds  
 Help us to do well on this test  
 Help us to recall all knowledge needed  
 So we can be rewarded for all our efforts and studying  
 In the name of the Father and the Son and the  
 Holy Spirit. Amen

**Marks: K/U: /18 App: /13 TIPS: /6 Comm: /9**

**Knowledge:**

[ /6]

**1. Circle the correct answer.**

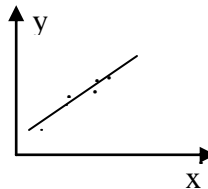
- a. . The four steps involved in statistical research are
  - A. surveys, personal interviews, telephone interviews, observation.
  - B. collecting, storing and organizing, retrieving, analyzing.
  - C. designing, collecting, analyzing, interpreting.
  - D. none of the above.
- b. Data can be collected by
  - A. being made available by others.
  - B. taking the results of an experiment.
  - C. an observational study.
  - D. none of the above.
  - E. A, B, and C above.
- c. The scatter plot shown to the side would be the best described as:
 
  - A. positive, weak, linear
  - B. positive, strong, non-linear
  - C. positive, no correlation,
  - D. negative, moderate strength, linear
  - E. negative, weak, non-linear
- d. Outliers
  - A. do not conform to the pattern of the other points.
  - B. affect the position of the line or curve of best fit.
  - C. should be quickly discarded.
  - D. both B and C
  - E. both A and B
- e. Correlation coefficient:
  - A. shows the strength of the relationship.
  - B. estimates data within the range of the scatter plot.
  - C. shows visually a trend, a relationship.
  - D. estimates data outside of the scatter plot range.
- f. Which of the following is NOT true?
  - A. If the independent and dependent axes are labeled incorrectly, the direction of the relation will be affected.
  - B. An example of an independent variable is time.
  - C. An example of a dependent variable is the height of a plant.
  - D. The independent variable is placed along the y-axis

**MAP 4C1-Two Variable Statistics**

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

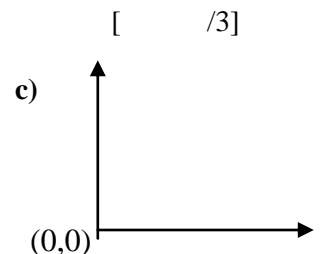
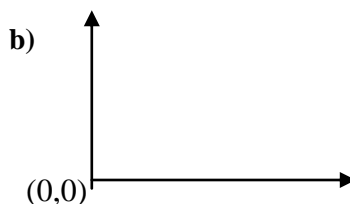
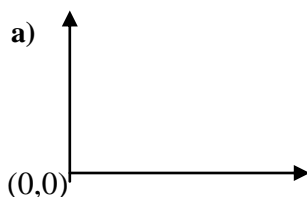
**Date:** \_\_\_\_\_

2. True or false? [ /12]
- a) The independent variable is labeled on the y-axis. T F
  - b) Examples of dependent variables include time and hours worked. T F
  - c) Finding a predicted value of y for  $x=135$ , when data was collected for  $50 \leq x \leq 150$  is called extrapolation. T F
  - d) The symbol that represents the correlation coefficient is “c”, which ranges from -1 to +1 T F
  - e) If a data set is small, you may generate misleading conclusions. T F
  - f) Interpolated data are found by extending trend lines. T F
  - g) If the correlation coefficient is  $r = + 0.299$ , the relation could be considered strong. T F
  - h) Linear regression is the process of creating a line of best fit. T F
  - i) The closer to -1 the correlation coefficient is the stronger the relation is T F
  - j) Examples of independent variables are number of swings of a pendulum and income. T F
  - k) In descriptive statistics a generalization about the population based on the sample is made T F
  - l) The scatter plot shown to the side is an example of a linear, strong, And positive correlation T F



**Application:**

1. For each relationship, label the axes below with the independent and dependent variables.
  - a) Number of swings of a pendulum and the length of the pendulum, in cm.
  - b) The number of student in a school and the number of teachers required to hire.
  - c) The time spend studying before a exam and the mark obtained.



[ /3]

2. The table below shows the total income of homeowners and the current value of their home in dollars.

Income (\$)	Value of Home (\$)
68 000	169 000
72 000	189 000
105 000	250 000
52 000	138 000
77 000	143 000
82 000	189 000
49 000	119 000
38 000	109 000
48 500	129 000

- a) Identify:

Independent variable: \_\_\_\_\_ [ /1]

Dependent variable: \_\_\_\_\_ [ /1]

- b) Using technology, create a scatter plot and answer the following questions based on it.

- i) what is the correlation coefficient (use the right symbol)

\_\_\_\_\_ [ /2]

- ii) describe the correlation (three-word description)

- 
- 
- 

[ C: /3]

- c) Using linear regression (on the calculator) write the equation of the line of best fit. Round your coefficients to two decimal digits.

\_\_\_\_\_ [ /3]

**Thinking, Inquiry and Problem Solving:**

- d) Predict the value of a house for a family with \$850 000 income (show your work)

[ /2]

Did you use interpolation or extrapolation to calculate this value? \_\_\_\_\_ [ /1]

- e) Predict the value of a house for a family with \$130 000 income (show your work)

[ /2]

Did you use interpolation or extrapolation to calculate this value? \_\_\_\_\_ [ /1]

**Communication:**

1.     a) What could you state about a correlation if the correlation coefficient  $r = -0.175$ ? [     /2]  
  
       b) How valid would be the prediction? Explain [     /2]
  
2.     Discuss the effect of an outlier on: [     /2]  
  
       a) correlation coefficient: \_\_\_\_\_  
  
       b) position of the line of best fit: \_\_\_\_\_
  
3.     List the three cases, we have discussed in class, in which misleading conclusions could be generated. [     /3]