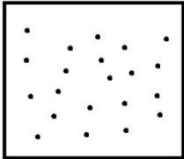
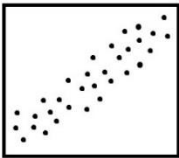

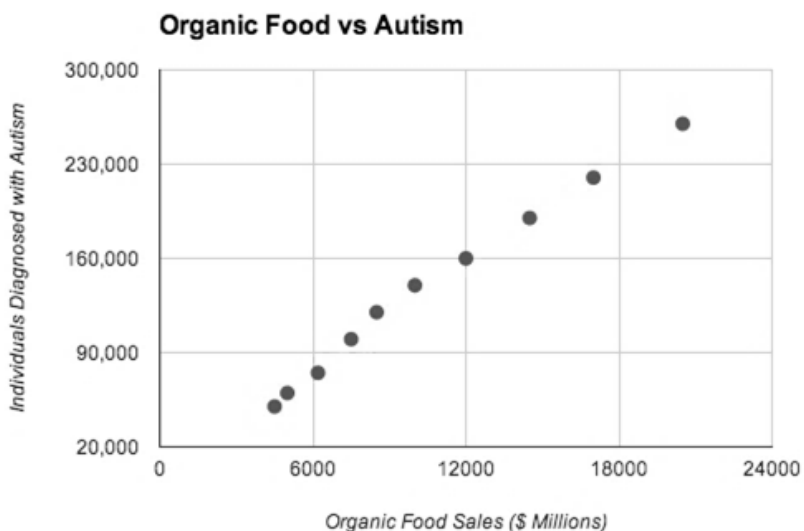


1. (3 pts) Label each scatterplot with one of the following:

Linear Association, Non-linear Association, No Association

|  |  |  |
|--|--|--|
| <p>A.</p> <p>_____</p>  | <p>B.</p> <p>_____</p>  | <p>C.</p> <p>_____</p>  |
|--|--|--|

2. (8 pts) The following graph shows the relationship between organic food sales in the U.S. and autism rates.



(a) Choose the Correlation Coefficient that best describes this graph (circle your answer):

$r = 0$        $r = -1$        $r = 2$        $r = .95$        $r = -.95$

(b) Circle the correct answer: This data shows that organic food sales and autism rates. . .

- (i) are strongly negatively correlated
- (ii) are weakly negatively correlated
- (iii) have zero correlation
- (iv) are weakly positively correlated.
- (v) are strongly positively correlated

(c) **True** or **false**: Organic food causes autism.

3. (20 pts) A sample of 6 households was monitored for one year. The household income (in thousands of dollars) and the amount of power they used (in kilowatts) is given in the table

The Correlation Coefficient and Regression Line Equation are also given.

|                      |    |    |    |    |     |    |
|----------------------|----|----|----|----|-----|----|
| Income (\$ thousand) | 31 | 40 | 23 | 48 | 195 | 96 |
| Power (Kilowatts)    | 5  | 13 | 10 | 15 | 61  | 33 |

**Correlation: Income , Power**

Correlation Coefficient = 0.991

**Regression Line Equation:**

Power = - 0.116 + 0.3180 Income

(a) Which variable is the predictor: \_\_\_\_\_

and which is the response: \_\_\_\_\_

(b) The r-value is .991. Judging by this, how close would the data points be to the regression line?

Very close      Somewhat close      Somewhat scattered      Very scattered      Can't tell

(c) Find the Coefficient of Determination, r-squared, and interpret it in the context of the problem.

(d) What is the slope of the regression line? \_\_\_\_\_

What does the slope mean in terms of income and power? Be specific and use units.

(e) Use the regression equation to predict how much power a household would use annually if their household income was \$100 thousand dollars.

This value is (choose one)      an extrapolation      a prediction (no extrapolation)

(f) Locate the y-intercept in the equation and interpret it in the context of the problem. Is it meaningful?

4. (4 pts) Use your knowledge of the world to determine whether the following pairs of events are mutually exclusive (ME) or not mutually exclusive

- |                                      |    |        |            |
|--------------------------------------|----|--------|------------|
| A person lives full time in SLO      |    |        |            |
| A person lives full time in Paso     | ME | not ME | can't tell |
| A student is a business major.       |    |        |            |
| A student is on the basketball team. | ME | not ME | can't tell |

5. (2 pts) Determine which of the following variables is continuous and which is discrete (circle the answer):

- |   |          |            |
|---|----------|------------|
| X = the number of cars not stopping at a stop sign. | DISCRETE | CONTINUOUS |
| X = the weight of a 2-year-old boy                  | DISCRETE | CONTINUOUS |

6. (8 pts) (a) If you were to flip a coin 3 times, list all the possible outcomes. Use H for heads, and T for tails

(b) Fill in the probability distribution for the number of heads obtained on three flips.

|                     |  |  |  |  |
|---------------------|--|--|--|--|
| X = number of heads |  |  |  |  |
| P(X) = probability  |  |  |  |  |

7. (14 pts) Suppose you have a bag with 1 yellow marbles, 3 red marbles, and 6 blue marbles. Find the following probabilities and express each as a fraction, a decimal, and a percent.

- (a) If you choose one marble,
- what is the probability it will be red?
  - What is the probability it won't be red?
  - What is the probability it will be yellow?
  - What is the probability it will be red or yellow?
- (b) If you choose two marbles **with replacement**, what is the probability both will be red?
- (c) If you choose two marbles **without replacement**, what is the probability both will be red?

8. (18 points) In Montreal, Canada, an experiment was done with parents of children who were thought to have a high risk of committing crimes when they became teenagers. Some of the families were randomly assigned to receive parental training, and the others were not. The results are summarized in the Two-Way Table below.

|                          | Parental Training | No Parental Training |  |
|--------------------------|-------------------|----------------------|--|
| Arrested (by age 15)     | 6                 | 38                   |  |
| Not Arrested (by age 15) | 37                | 86                   |  |
|                          |                   |                      |  |

- (a) What is the research question?
- (b) What are the variables?
- (c) What percentage of the entire group were not arrested by age 15?
- (d) What percentage were not arrested, given that their parents had training?
- (e) What percentage were not arrested, given that their parents did not have training?
- (f) Are the variables you described in part (b) associated or independent? Explain, and include the percentages you found in the explanation.

9. (20 pts) Blood Cell Count. The distribution of red blood cell (RBC) counts in healthy men is approximately normal, with a mean of 5.1 million cells per microliter and a standard deviation of 0.3 million cells per microliter.

(a) Sketch a normal curve showing the distribution of RBC's . Clearly label the x-axis and fill in all relevant tick marks. Also sketch the z-axis below the x-axis and fill in all relevant tick marks.

(b) What percentage of healthy men have an RBC count of 5.1 million cells or lower? \_\_\_\_\_

(c) What would be an unusually high RBC count? \_\_\_\_\_

(d) What would be an unusually low RBC count? \_\_\_\_\_

(e) Shade the region that represents the percentage of healthy men with RBC counts between 4.2 and 5.5 million cells per microliter.

Which of the following is the best estimate of this percentage? (Circle the best answer)

(i) 50%

(ii) 68%

(iii) 84%

(iv) 16%

(f) Find the z-score for an RBC count of 4.3 million cells and interpret it in the context of the problem.

Plot both 4.3 and the z-score on the graph you made in part (a).

10. (3 pts) Suppose a man has an RBC count with a z-score of .7. What can you deduce from this (just regarding the RBC's and what you would tell him?

(a) The man has slightly more RBC's than average. "Your RBC count is fine."

(b) The man has slightly fewer RBC's than average "Your RBC count is fine."

(c) The man has many, many more more RBC's than average. "I'm concerned about your RBC count."

(d) The man has a lot fewer RBC's than average. "I'm concerned about your RBC count."

(e) Can't tell from this information.