

Statistics Test 2

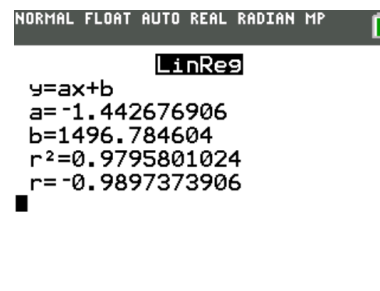
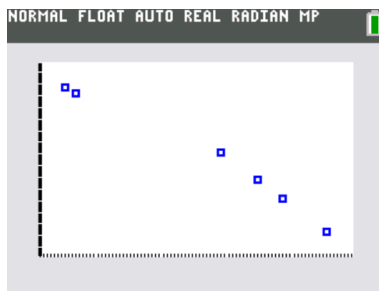
Number of questions—3

Directions: Solve each of the following problems using separate paper, while clearly indicating each problem number when solving. Irrelevant work will detract from your score, while answers without work shown will be awarded no credit. Answers with partially correct work will receive partial credit. Unless otherwise specified, round all answers to 3 decimal places when necessary. You must work alone, but you may use a graphing calculator as a supplement to your own work if you indicate the steps used. You may not use a phone, computer, computational intelligence, AI, or other tools to assist you in solving the problems.

1. Can a low barometer reading be used to predict maximum wind speed of an approaching tropical cyclone? Data for this problem are based on information taken from *Weatherwise* (Vol. 46, No. 1), a publication of the American Meteorological Society. For a random sample of tropical cyclones, let x be the lowest pressure (in millibars) as a cyclone approaches, and let y be the maximum wind speed (in miles per hour) of the cyclone.

x	1004	975	992	935	985	932
y	40	100	65	145	80	150

A calculator was used to produce a scatter plot and regression equation.



- (a) (8 pts) Describe the association between the variables based on the scatter plot.
- (b) (8 pts) What is the correlation coefficient and how does it help justify the association you described?
- (c) (8 pts) What is the equation of the least-squares line?
- (d) (8 pts) Use the equation of the least-squares line to predict the maximum wind speed when the lowest pressure is 950.
- (e) (8 pts) What kind of prediction did you just make?
- (f) (8 pts) What percentage of the variation in the maximum wind speed can be explained by the lowest pressure?

2. Woody, Buzz, Slinky, Rex, Bo, Jessie, and Hamm are all toys in a playroom. All toys are equally likely to be chosen to be played with or to be donated. Toys can only be donated once, but they can be played with multiple times.
- (a) (*7 pts*) If one toy is donated, what is the probability that Rex is chosen?
 - (b) (*7 pts*) If one toy is donated, what is the probability that Rex or Hamm is chosen?
 - (c) (*7 pts*) If instead two toys are donated, what is the probability that Rex is chosen first, and then Hamm is chosen second?
 - (d) (*7 pts*) If instead a toy is to be played with on Monday, and then a toy is to be played with on Tuesday, what is the probability that Buzz is played with on both days?
3. The following table lists ice cream orders from an ice cream truck from one summer day:

	Sprinkles	No Sprinkles	Total
Vanilla	51	4	55
Chocolate	51	14	65
Total	102	18	120

- (a) (*12 pts*) What is the probability that an ice cream order was for chocolate given that it had no sprinkles?
- (b) (*12 pts*) What is the probability that an ice cream order was for vanilla or that it had sprinkles?