

Name: _____
MATH 108
Fall 2022
HW 7: Due 10/13

*“The only function of economic
forecasting is to make astrology look
respectable.”*

–John Galbraith

Problem 1. (10pt) As accurately as possible and showing all your work, find the least square regression line, along with the r and r^2 value, for the dataset $\{(1, 0), (0, 1), (1, 1), (2, 6)\}$. Show all your work.

Problem 2. (10pt) Given the following information below, find the least square regression line. Show all your work.

$$n = 10$$

$$R = -0.0023$$

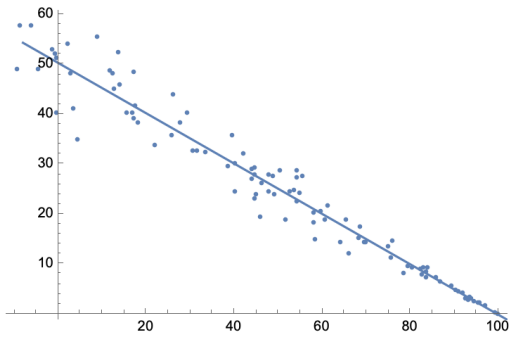
$$\bar{x} = 0.97$$

$$s_x^2 = 30.32$$

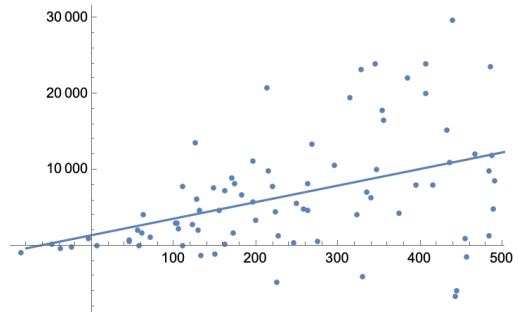
$$\bar{y} = -1.33$$

$$s_y^2 = 36.54$$

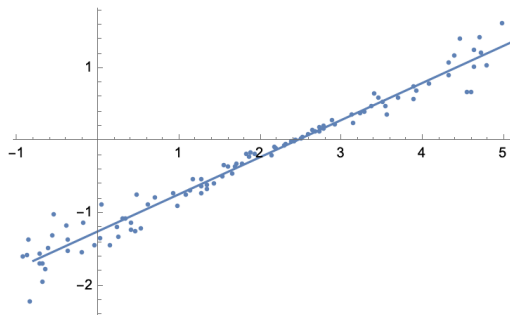
Problem 3. (10pt) Match each regression coefficient to its corresponding graph.



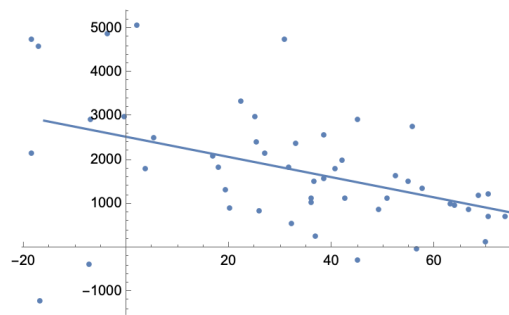
(a)



(b)



(c)



(d)

- (i) _____: $R = -0.9725$
- (ii) _____: $R = -0.4639$
- (iii) _____: $R = 0.4337$
- (iv) _____: $R = 0.9826$

Problem 4. (10pt) A researcher is predicting penguin weights given their final adult height. The create a linear regression model for the weight of the penguin (in lbs), W , given its height in cm, h . Their model is $W(h) = 0.8h - 56.2$.

- (a) What are b_0 and b_1 for this linear regression?
- (b) How much does a penguin's weight increase per centimeter taller that it is, according to this model?
- (c) Does the y -intercept for this model hold any meaning? Explain.
- (d) Predict a penguin's weight if its height is 125 cm. Suppose one of the penguins in their dataset has a height of 125 cm and weight of 48.6 lbs. Find the residual for this datapoint.
- (e) The researcher finds an R^2 value of 0.4329. Is this linear model a good predictor of a penguin's weight given its height? Explain.