Name: _____
MATH 108
Spring 2024
HW 16: Due 04/10

"I should let you know, I read a book on Jiu-Jitsu, and I am prepared to throw it at you."
— Sheldon Cooper, Young Sheldon

Problem 1. (10pts) For a general model, what is the difference between interpolation and extrapolation? For a linear regression, what is R^2 and what does it tell you?

Problem 2. (10pts) A researcher is trying to determine if one can predict college success from a student's ACT scores. Specifically, whether one can predict a student's first semester college GPA using their ACT score. The researcher gathers data and creates a linear regression to fit the data. The researchers finds $G = 0.061A + 2.03$, where A is the student's ACT scores and G is the student's GPA. The researcher finds an R^2 value of 0.0726.

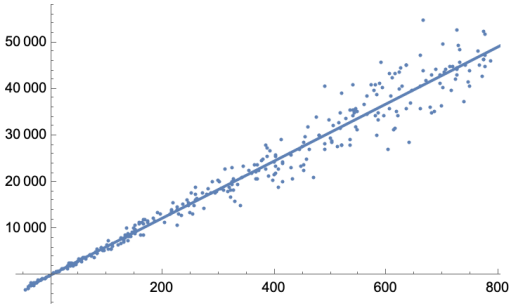
(a) Identify b_0 and b_1 for this model.

(b) Predict a student's first semester GPA that receives an ACT score of 20.

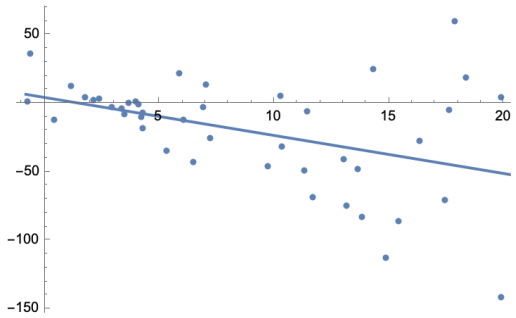
(c) If a student that received an ACT score of 20 had a first semester GPA of 3.010, compute the residual for this student.

(d) Does there appear to be a (linear) relationship between ACT score and GPA? Explain using the coefficient of determination.

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



(a)



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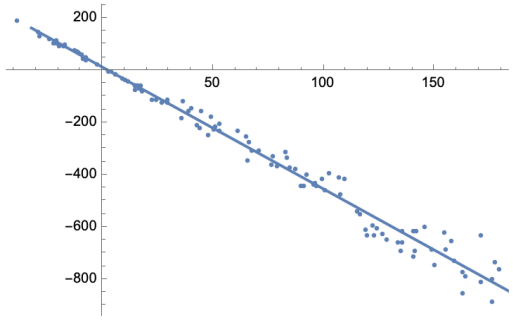
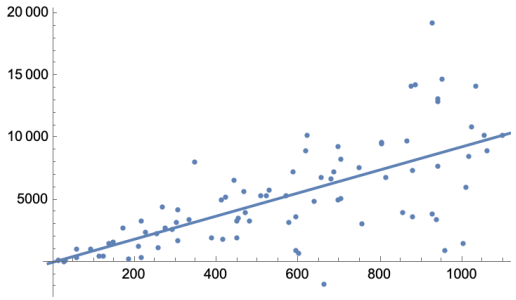


(c)



(d)

(i) _____: $R = 0.981608$

(ii) _____: $R = 0.693245$

(iii) _____: $R = -0.425885$

(iv) _____: $R = -0.991438$