Write all answers in your blue book and show all work there. Return your exam and printout(s) in your blue book.

17 pts.

<table>
<thead>
<tr>
<th>Q_D</th>
<th>P_OWN</th>
<th>P_SUB</th>
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a) Find by hand (show work) the regression equation where Q_D is a function of P_OWN.

b) Find the standard error of the estimate and use it to construct a 90% confidence interval for \( \mu_{y|x} \), where P_OWN = 11/3.

c) Find the standard error of the estimate and use it to for the significance of P_OWN, \( \alpha = .1 \).

d) Find \( r^2 \) and interpret it.

e) Are there sufficient degrees of freedom to add P_SUB to the model? Explain.

17 pts.

2) Use the following information to set up normal equations and solve for a and b.

\[
\Sigma Y=10, \Sigma X=12, \Sigma XY=20, \Sigma X^2=40, n=4
\]

20 pts. **Computer Problem**

3) Open StkData in the Chap. 16 Stat2216 files folder. Run a regression with P/Eratio as the dependent variable and Gross Profit Margin and a dummy variable (that you make) for industry equals 2 as the independent variables. Take care to read through the following parts, so that you’ll have all that you need.

a) Determination which, if any, of the variables are statistically significant (\( \alpha = .05 \)) and

b) Reconcile your finding in a) with the AOV that you see.

c) How much higher(lower) is the P/E ratio due to being in industry 2?

d) Check for influential observations.

e) Check for 2 econometric problems (your choice) that seem relatively likely to occur in this model.
4) Draw well-labeled sketch of each of the following regression equations.

a) $Y = 10 - 2X + 5\text{Dummy}$

b) $Y = 10 - 2X + .1X^2$

c) $\log_{10}Y = 1 + .03X$

I have neither given nor received unfair aid on this test nor am I aware of anyone else who has.

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