

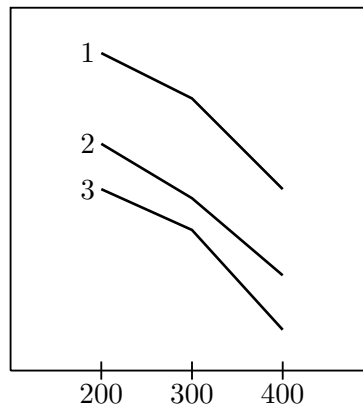
Name: _____
MAT 222
Fall 2019
Homework 10

“Clark Kent is Superman’s critique on the whole human race.”
–Bill, Kill Bill: Volume 2

Problem 1: An ANOVA F -test is a generalization of what kind of test?

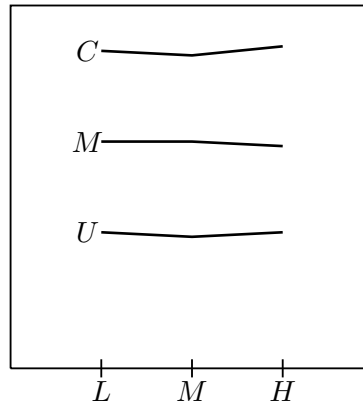
Problem 2: Suppose one is testing the hypothesis $H_0 : \mu_1 = \mu_2 = \mu_3 = \mu_4$ for an ANOVA F -test. If one rejects the null hypothesis, does this mean all the means μ_i are distinct? Explain.

Problem 3: Suppose you are comparing the average cooking time for 3 brands of ovens at temperatures of 200°F, 300°F, and 400°F. Below is an interaction plot for a two-way ANOVA analysis.



Does the plot indicate an interaction between oven temperature and brand of oven? Explain. Which of the following effects are important: oven brand, temperature, oven brand and temperature, or neither. Explain.

Problem 4: Suppose you are comparing the average tax rate of 3 different countries: the United States, Canada, and Mexico, by income level: low, middle, and high. The interaction plot for a two-way ANOVA test is shown below.



Does the plot indicate an interaction between country and income level? Explain. Which of the following effects are important: country, income level, country and income level, or neither. Explain.

Problem 5: Which of the following are contrasts? Indicate the ψ which are contrasts by placing a checkmark next to the ψ .

- (a) _____: $\psi := 2\mu_1 + \mu_2 - 2\mu_3$
- (b) _____: $\psi := \mu_1 - 0.5\mu_2 - 0.5\mu_3$
- (c) _____: $\psi := 3\mu_1 - 2\mu_2 - 2\mu_3 + \mu_4$
- (d) _____: $\psi := \mu_1 - \mu_2 + \mu_3 + \mu_4 - \mu_5$

Problem 6: Construct a contrast from $\mu_2 = \frac{\mu_1 + \mu_3}{2}$. What are a_1 , a_2 , and a_3 for your contrast?