

**EXAM 3**  
Stat 201  
April 10, 2008

Name \_\_\_\_\_

1. An experiment was conducted to examine the effect of age on heart rate when a subject performs a specific amount of exercise. Ten male subjects were randomly selected from four age groups: 10-19, 20-39, 40-59, and 60-69. Each subject walked a treadmill at a fixed grade for a period of 12 minutes, and the increase in heart rate-the difference before and after exercise-was recorded (in beats per minute). These data are shown in the following table. Do the data provide sufficient evidence to indicate a difference in mean increase in heart rate among the four age groups? If so which groups have different mean heart rate increases? Test using ANOVA with  $\alpha = 0.10$ . What is the smallest  $\alpha$  that would allow you to reach the desired conclusion?

10-19	20-39	40-59	60-69
29	24	37	28
33	27	25	29
26	33	22	34
27	31	33	36
39	21	28	21
35	28	26	10
33	24	30	25
29	34	34	24
36	21	27	33
22	32	33	32

2. On page 329-30 (problem 8.2.5) there is data on bone strength in patients of various ages. Use the data (together with the descriptions of the data) to decide whether the mean bone strength is different among these groups using an  $\alpha$  level of 0.01. Which (if any) age group has the lowest bone strength? State any assumptions you made and indicate what your rejection criteria would be. (You may use SPSS on this problem but the last part will have to be done on your own.)

3. See problem 16 on page 459-60. For this problem create a scatter plot. Comment on the advisability of using linear regression on this data with blood pressure as the dependent variable. (You may mention the scatter plot here but it is not enough, more evidence is needed.) Find a linear regression model for this data. What would you expect the mean blood pressure to be, among the group of people who have a plasma epinephrine concentration of 120? If I choose a person with a plasma epinephrine concentration of 265.50, give me an interval that you are 95% certain will contain the blood pressure of this person.

4. The following table gives the systolic blood pressure, birthweight (oz), and age (days) of 16 infants.

Age (days)	Weight (oz)	Blood pressure
3	135	89
4	120	90
3	100	83
2	105	77
4	130	92
5	125	98
2	125	82
3	105	85
5	120	96
4	90	95
2	120	80
3	95	79
3	120	86
4	150	97
3	160	92
3	125	88

Treating Age and Weight as independent and Blood Pressure as dependent, does a linear model make sense here? Why or why not? Regardless of your discussion above find a 99% confidence interval for the predicted blood pressure of an infant 3 days old and weighing 7 lbs. 8 oz. Discuss the correlation coefficient. Estimate the mean blood pressure of infants which are 5 days old and weigh 11 pounds and find a 95% confidence interval for this mean..

5. Boles and Johnson examined the beliefs held by adolescents regarding smoking and weight. Respondents characterized their weight into three categories: underweight, overweight, or appropriate. Smoking status was categorized according to the answer to the question, "Do you currently smoke, meaning one or more cigarettes per day?" The following table shows the results of a telephone survey of adolescents in the age group 12-17.

	Smoking Yes	Smoking No
Underweight	17	97
Overweight	25	142
Appropriate	96	816

Do these data indicate that weight perception and smoking status are independent of one another?

6. Problem 12.3.4 and problem 22 on page 665. (Each problem to follow the instructions as stated in the textbook)