STA 110B Name_____

Spring 2000 Section_____

# Quiz 9

week of 03APR2000

**1.** Consider a study performed to assess attitudes toward welfare payments, with 3 groups of 9 people each. The first group is a random sample from the middle class, the second group consists of current welfare recipients, and the third group is from the lower-middle class. A respondent whose score is high is strongly supportive of welfare payments. We are interested in comparing the mean score (the average level of welfare support) among these 3 groups using the ANOVA method. (Assume that the assumptions are satisfied so that this method is a valid choice.)

**a**. (6 points) Fill in the three marked spots in the ANOVA table for this study given below. (Factor A represents the 3 socioeconomic groups in the study.)

| Source | Sum Sq. | d.f. | Mean Sq. | F |
|---|---|---|---|---|
| Factor A | 114.9630 | 2 | 57.4815 | 7.8186 |
| Residual | 176.4444 | 24 | 7.3519 | |
| TOTAL | 291.4074 | 26 | | |

**b**. (1 point) Define the null and the alternative hypotheses.

$H_0$: $\mu_1 = \mu_2 = \mu_3$ All 3 groups are from the same population (they have the same mean).
$H_A$: at least one of the $\mu$s is different from one or more of the others

**c**. (1 point) What is the p-value associated with this test?

$0.001 < p < 0.01$

**d**. (2 points) At the 5% error level, what can we conclude from our sample and our test? Explain which hypothesis you support and why (in math or a very brief phrase).

At $\alpha = 0.05$, we have enough evidence to reject the null hypothesis, since $p < \alpha$. In other words, we believe at least one of the group means is statistically discernible from one or more of the others.