Economics 103A Dr. Tom Means

Exam #3 Fall 2012

**Name**

Instructions. Do all of the problems in numerical order. Show all of your work. Partial credit awarded where possible.

1. Two groups were selected for an experiment. The sample data is reported below.

**Group A Group B**

Mean Spending ($) 90 100

Standard deviation ($) 10 25

# of Males 8 12

Sample Size 20 25

(10) a. Set up a 95% confidence interval for the population variance for group A?

(10) b. Test at the 10% level the hypothesis that the population variance from Group B is not equal than Group A? (Hint: use a two-tail test, put B in numerator)

(10) c. At the 1% level does group A have a different mean spending level than Group B?

(10) d. At the 5% level is the proportion of males in group B higher than Group A?

2. A roulette wheel contains 18 red numbers, 18 black numbers, and two green numbers. The table below shows the frequency with which the ball landed on each color in 114 trials.

Color Red Black Green

Frequency 48 60 6

(10) a. Perform a 2 test to determine if the roulette wheel is fair (equal probabilities for each number, P(R) = P(G) = 18/38) . Set the Type I error equal to 5%.

**3.** The President and Democrats want to raise taxes only on the poorest 5% of income earners because they don't pay their fair share. Republicans want to raise taxes for only California residents. A sample of 200 people recorded the following results.

Democrats Republicans Independents Tea Party

Raise taxes only on the poorest 5% 60 15 25 5

Extend tax cuts only for CA res. 20 35 25 15

(10) a. At the 10% level does the above data support the hypothesis that party affiliation and preference for tax policy are unrelated? To receive full credit you must write out the expected frequency table.

**4.** The data below reveals the breakdown by game of the 49'ers first 20 plays between passes and runs. The offensive coordinator says that he tries to balance the pass-run ratio (i.e. an equal number of passes and runs).

Opponent Pass/30

Atlanta 8

Philadelphia 10

Arizona I 5

Cincinnati 10

Tampa Bay 12

St. Louis 10

Arizona II 15

(10) a. Using a 2 test at the 1% level, test whether the distribution of plays for these 7 games is purely random? (Hint. The expected number of passes is equal to 10 for each game and use d.f. = 7)

(10) c. Set up a 99% confidence interval for the difference in proportions for the Arizona I and Arizona II game.