Name: _____

Economics 300
Summer 2010
June 16, 2010

Test #1

Each problem is weighted equally. Write your answers on the test; use an appropriate number of significant digits for each answer; continue answers on the back if additional space is needed. In order to get full credit, you must show the reasoning and calculations used to arrive at your answers.

(1) Suppose you were interested in finding out the percentage of U.S. citizens who want U.S. troops to withdraw immediately from Iraq. Describe two different ways you could go about estimating this percentage, and list two drawbacks for each of your ways.

(2) You have a sample of ten fish, with the weights (in ounces) of:

21, 73, 59, 63, 43, 78, 93, 84, 85, 59

a. What is the range of this sample?

b. What is the median of this sample?

c. What is the mean of this sample?

d. What is the standard deviation of this sample?

(3) According to the *Annual Report of the Dean of Admission* (October 2005), there were 717 people in Wesleyan's Class of 2009; 349 were men, 206 were students of color, and 97 were both male and students of color.

a. What percentage of the 717 students are students of color?

b. What percentage of the 717 students are female students of color?

c. If a randomly-selected one of these 717 students is a woman, what is the probability she is a student of color?

(4) The U.S. population is distributed according to the four standard blood types as follows (http://en.wikipedia.org/wiki/Blood_type):

O	—	44%
A	—	42%
B	—	10%
AB	—	4%

Assuming that people choose their mates independent of blood type, calculate the probability that a randomly sampled couple from this population will have the same blood type.

(5) At the Foxwoods Resort and Casino in Southern Connecticut, they used to offer a game called chuck-a-luck. To play, you bet on a number from 1 to 6. If one of the dice shows your number, you win the amount you bet. If two dice show the number, you win twice the amount you bet. If all three dice show the number, you win ten times the amount you bet.

a. What is the probability of losing?

b. What is the expected value of playing this game if you bet a dollar? Why do you think they don't offer this game any more at the casino?

(6) You and I are going to toss a fair coin repeatedly until one of these sequences occurs: HT (heads followed by tails) or TT (tails followed by tails). If my sequence comes up first, you pay me a dollar; if your sequence comes up first, I pay you a dollar. At that point we stop and start all over again. Given that we are going to play this game repeatedly, which sequence would you choose? Does it matter which sequence you choose? Explain.

(7) One stage of a production process requires a delicate adjustment. If the machinery for this operation has been properly adjusted, 10% of the units produced will be defective; but if not, 40% will be defective. In the past, the proper adjustment has been made 85% of the time.

a. What is the probability that a unit will be found defective?

b. Suppose that a unit is tested and found defective. What is the probability that the machinery has been properly adjusted?

(8) Ryan is a taste tester in a pickled pepper factory. There is a twenty percent probability that any given pickled pepper he tastes will make his lips pucker.

a. If he tastes nine pickled peppers, what is the probability that he will not pucker at all?

b. If he tastes nine pickled peppers, what is the probability that he will pucker at least once?

c. If he tastes nine pickled peppers, what is the probability that he will pucker exactly once?

(9) Isabelle sells izunes, a new kind of music player, and she notes that the time from sale until an izune stops working is normally distributed with a mean of twenty months and a standard deviation of four months.

a. What percentage of izunes will have stopped working by one year after their sale?

b. At what point in time after sale will four percent of izunes still be working?

(10) At Ross's Roast Beef you can buy a 4 ounce or 8 ounce roast beef sandwich. You can also order a 16 or 32 ounce milk shake. Ross has noticed that burger and milk shake combined orders have the following distribution:

	milk shake size	
hamburger size	16	32
4	.30	.10
8	.20	.40

a. Calculate the mean and standard deviation for milk shake size.

b. If an individual has ordered an 8 ounce hamburger, what will be his or her average shake size?

c. Is hamburger size independent of milk shake size? Explain how you arrived at your answer.