Name: _____ Business Data Analysis
Date: 201-316-VA

In Class Exercise #9: Counting and Probability Distributions

1. **Balls in urn**

   An urn contains 10 balls that are identical except for color: 4 green balls, 5 blue balls and 1 red ball. Two balls are drawn from the urn, one after another and without replacement.

   (a) Draw a tree diagram that includes probabilities to map out the possible results for the two draws and their associated probabilities. Use exact fractions. Check that the probabilities sum to 1.

   (b) Let x be the number of green balls drawn. Use your answer in part a) to create a probability distribution for x in a small table. Use exact fractions. Check that the probabilities sum to 1.

   (c) Find the mean and standard deviation for x from part b)

2. **Deck of Cards**

A standard deck of 52 cards contains 4 suits (heart, diamonds, clubs, spades), and each suit has 1 card of each of the 13 ranks (10 number cards, and 3 face cards: J, K, Q)

Answer in fractions, and show your steps. When drawing cards without replacement from the deck...

(a) What is the probability that when drawing 3 cards, all 3 are hearts?

(b) What is the probability that when drawing 2 cards, one is a heart and one is a spade?

(c) In a certain game, you draw 2 cards, and you will win if both are hearts or both are faces. What is the probability of winning?

3. **Counting**

An activities club has 12 members.

(a) How many different committees can they make consisting of 4 members?

(b) How many different committees can they make consisting of 1 president, 1 vice-president, 1 teasurer and 1 secretary?