Name:

Elementary Statistics

- The winning numbers for the current California Fantasy 5 lottery are 13, 18, 22, 24, and 32 in any order. Do the calculations for winning this lottery involve permutations or combinations? Why?
- 2. When randomly selecting items, if successive selections are made *with replacement* of previously selected items, which of the five rules of this section apply?
 - (1) fundamental counting rule
 - (2) factorial rule
 - (3) permutations rule--when all items are different
 - (4) permutations rule--when some items are identical to others
 - (5) combinations rule
- 3. A fan of Lady Antebellum music plans to make a custom CD with 12 of her 27 songs. How many different combinations of 12 songs are possible? Is it practical to make a different CD for each possible combination?
- 4. In the game of blackjack played with one deck, a player is initially dealt 2 different cards from the 52 different cards in the deck. Find the probability of getting a 2-card initial hand consisting of the ace of clubs and the ace of spades in any order.
- 5. A classic counting problem is to determine the number of different ways that the letters of "MISSISSIPPI" can be arranged. Find that number.
- 6. The author of our Statistics textbook currently has six different books in print. If those six books are stacked in a random order, what is the probability that they are arranged in alphabetical order from top to bottom?

7. In the Illinois Little Lotto game, you win the jackpot by selecting five different whole numbers from 1 through 39 and getting the same five numbers (in any order) that are later drawn. What is the probability of winning a jackpot in this game?

- 8. In the Illinois Pick 3 game, you win a bet by selecting three digits (with repetition allowed) and getting the same three digits in the exact same order as they are later drawn.
 - a. What is the probability of winning this game?
 - b. The Illinois Pick 3 game returns \$500 for a winning \$1 ticket. What should be the return if Illinois were to run this game for no profit?
- 9. The author owns a safe in which he stores all of his great ideas for the next edition of this statistics book. The safe "combination" consists of four numbers between 0 and 99, and the safe is designed so that numbers can be repeated.
 - a. If another author breaks in and tries to steal these ideas, what is the probability that he or she will get the correct combination on the first attempt?
 - b. Assume that the numbers are randomly selected. Given the number of possibilities, does it seem feasible to try opening the safe by making random guesses for the combination?