13. Classic Counting Problem A classic counting problem is to determine the number of different ways that the letters of "Mississippi" can be arranged. Find that number.

14. Statistics Count How many different ways can the letters of "statistics" be arranged?

15. Connecticut Lottery Winning the jackpot in the Connecticut Classic Lotto requires that you choose six different numbers from 1 to 44, and your numbers must match the same six numbers that are later drawn. The order of the selected numbers does not matter. If you buy one ticket, what is the probability of winning the jackpot?

16. Florida Lottery Winning the jackpot in the Florida Lotto requires that you choose six different numbers from 1 to 53, and your numbers must match the same six numbers that are later drawn. The order of the selected numbers does not matter. If you buy one ticket, what is the probability of winning the jackpot?

17. Teed Off When four golfers are about to begin a game, they often toss a tee to randomly select the order in which they tee off. What is the probability that they tee off in alphabetical order?

18. Stacking Books The author currently has seven different books in print. If those seven books are stacked in a random order, what is the probability that they are arranged in alphabetical order from top to bottom?

19. Maine Lottery

a. In the Maine Megabucks game, you win the jackpot by selecting five different whole numbers from 1 through 41 and getting the same five numbers (in any order) that are later drawn. What is the probability of winning a jackpot in this game?

b. In the Maine Pick 4 game, you win a straight bet by selecting four digits (with repetition allowed) and getting the same four digits in the exact same order they are later drawn. What is the probability of winning this game?

c. The Maine Pick 4 game returns $5000 for a winning $1 ticket. What should be the return if Maine were to run this game for no profit?

20. Illinois Lottery

a. 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?

b. 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. What is the probability of winning this game?

c. 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?

21. Corporate Officials and Committees The Teknomill Corporation must appoint a president, chief executive officer (CEO), chief operating officer (COO), and chief financial officer (CFO). It must also appoint a Planning Committee with four different members. There are 12 qualified candidates, and officers can also serve on the committee.

a. How many different ways can the officers be appointed?

b. How many different ways can the committee be appointed?

c. What is the probability of randomly selecting the committee members and getting the 4 youngest of the qualified candidates?

22. Phase I of a Clinical Trial A clinical test on humans of a new drug is normally done in three phases. Phase I is conducted with a relatively small number of healthy volunteers. For