66. Use a tree diagram to find the number of ways that the World Series can occur, where the first team that wins four games out of seven wins the series.

36. A computer network consists of six computers. Each computer is directly connected to at least one of the other computers. Show that there are at least two computers in the network that are directly connected to the same number of other computers.

44. There are 51 houses on a street. Each house has an address between 1000 and 1099, inclusive. Show that at least two houses have addresses that are consecutive integers.

34. Suppose that a department contains 10 men and 15 women. How many ways are there to form a committee with six members if it must have more women than men?

4. Find the coefficient of \(x^5 y^8\) in \((x + y)^{13}\).

24. Show that if \(p\) is a prime and \(k\) is an integer such that \(1 \leq k \leq p - 1\), then \(p\) divides \(\binom{p}{k}\).

28. Show that if \(n\) is a positive integer, then \(\binom{2n}{2} = 2\binom{n}{2} + n^2\)
   a) using a combinatorial argument.
   b) by algebraic manipulation.

*32. Prove the binomial theorem using mathematical induction.