24. How many ways are there for 10 women and six men to stand in a line so that no two men stand next to each other? [Hint: First position the women and then consider possible positions for the men.]

30. Seven women and nine men are on the faculty in the mathematics department at a school.

   a) How many ways are there to select a committee of five members of the department if at least one woman must be on the committee?
   b) How many ways are there to select a committee of five members of the department if at least one woman and at least one man must be on the committee?

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?

8. What is the coefficient of $x^8y^9$ in the expansion of $(3x + 2y)^{17}$?

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

44. How many ways are there for a horse race with four horses to finish if ties are possible? [Note: Any number of the four horses may tie.]

   (Hint: There are five cases; the answer is 75; I want explanations)