Radio Programming

Jeffrey works as a DJ at a local radio station. He does the drive shift from 16 00 to 20 00, Monday to Friday. Before going on the air, he must choose the music he will play during these four hours.

The station has a few rules that Jeffrey must follow, but he is allowed quite a bit of leeway. Jeffrey must choose all his music from the top 100 songs for the week and he must play at least 12 songs an hour. In his first hour, all his choices must be from the top-20 list.

1. In how many ways can Jeffrey choose the music for his first hour?

2. In how many ways can he program the second hour if he chooses at least 10 songs that are in positions 15 to 40 on the charts?

3. Over his 4-h shift, he will play at least 48 songs from the top 100. In how many ways can he choose these songs?

In these questions, Jeffrey can play the songs in any order. Such questions can be answered with the help of combinatorics, the branch of mathematics introduced in Chapter 4. However, the permutations in Chapter 4 dealt with situations where the order of items was important. Now, you will learn techniques you can apply in situations where order is not important.