Section 6.1: Counting Techniques

Exercises

1. How many 2-digit numbers are

   a) even?
   b) divisible by 7?
   c) not divisible by 7?

2. How many 4-digit numbers are

   a) divisible by 3?
   b) divisible by 5?
   c) divisible by 3 and 5?
   d) divisible by 3 or 5?
   e) divisible by neither 3 nor 5?

3. A computer system requires a case-sensitive, alpha-numeric password containing 4 or 5 characters. How many possible passwords are there?

4. A computer system requires a case-sensitive, alpha-numeric password containing 5 digits. How many possible passwords are there if

   a) you can repeat characters?
   b) you cannot repeat characters?
   c) you can repeat characters but the first character must be a letter and not a digit?

5. A computer system requires an eight-character, case-sensitive, alpha-numeric passwords.

   a) How many possible passwords are there?
   b) How many passwords are there that contain at least one digit?
   c) How many passwords are there that contain at least one letter?
   d) How many passwords are there that contain at least one digit and one letter?

6. A computer system requires a case-sensitive, alpha-numeric password containing six characters.

   a) How many passwords are there that contain no “A”s?
   b) How many passwords are there that contain no “a”s?
   c) How many passwords are there that contain no “A”s or “a”s?

7. For homework, Peter has assigned reading pages 25-37 inclusive. How many pages has he asked his class to read?

8. Gilles has assigned for homework all the odd questions from 7 to 89. How many homework questions has he assigned?

9. Canadian postal codes are of the form "letter-number-letter number-letter-number". The first letter shows which province or territory is from, for a total of 13 letters allowable. The remaining letters can be any letter of the alphabet except for O and I. All numbers are allowed. How many possible Canadian postal codes are there?

10. How many days of the week

    a) contain the letter "t"?
    b) contain the letter "s"?
    c) contain the letters "t" and "s"?
    d) contain the letters "t" or "s"?

11. Pat is writing up systems of equations containing two variables. She will be using lower-case letters for her variables, but doesn't want to use the letters "e", "i", and "o" (for obvious reasons!). How many possible letter combinations does she have to choose from?

12. The mythical Canadian province of Gondor has licence plates of the form "letter-letter number-number-number". Because of an odd superstition, you cannot repeat a letter on the licence plate, but you can repeat a number. How many possible Gondorian licence plates are there?