

Permutations (Part 2)

These notes are intended as a summary of section 8.3 (p. 708 – 711) in your workbook. You should also read the section for more complete explanations and additional examples.

Permutations Involving Identical Objects

Consider the word BOB. How many permutations of this word are possible?

The number of permutations of n objects with j identical objects, is given by

$$\frac{n!}{j!}$$

This can be extended to any number of identical objects. For example, the number of permutations of n objects with j identical objects of one kind, k of a second kind, and l of a third kind, would be

$$\frac{n!}{j!k!l!}$$

Example (not in workbook)

How many different 5 digit numbers can be made by arranging the digits of 46164?

Example (not in workbook)

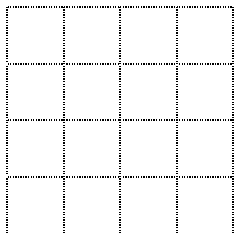
How many permutations are there of the letters of the word MISSISSIPPI?

Example 1 (sidebar p. 709)

There are 7 boxes of cereal on a shelf. Five of the boxes are bran cereal, one box is puffed wheat, and the other box is granola. How many ways can the boxes be arranged in a row?

Example 2 (sidebar p. 710)

Graeme walks 8 blocks from his home to the library. He always walks 4 blocks east and 4 blocks south. How many ways can Graeme walk to the library?



Example 3 (sidebar p. 711)

A kabob recipe requires 2 mushrooms, 2 shrimp, 2 cherry tomatoes, and 2 zucchini slices. How many ways can Amelie arrange these items on a skewer?

Homework: #3 – 7, 9, 12 in the section 8.3 exercises (p. 712 – 715). Answers on p. 716.