

Chapter 4. Counting

Section 4.1. The Basics of Counting

Note. In this section we state two rules for counting how many ways a task (or “experiment”) can be performed. These results are often used in introductory probability theory.

Note. The Sum Rule states: If a first task can be done in n ways and a second task can be done in n_2 ways, and if these tasks cannot be done at the same time, then there are $n_1 + n_2$ ways to do *either* task.

Example. How many ways can a card be chosen from a standard deck if we know the card is either an ace or a face card?

Note. If the tasks can be performed at the same time, we must be careful. For example, how many ways can a card be chosen from a standard deck if we know the card is either a diamond or a face card?

Note. The Product Rule states: Suppose that a product can be broken into two tasks. If there are n_1 ways to do the first task and n_2 ways to do the second task after the first task has been done, then there are $n_1 n_2$ ways to do the procedure.

Example. Page 243 Number 28.

Note. We can use “tree diagrams” for counting (see pages 240–241).

Example. Page 243 Number 48.

Revised: 4/4/2019