

1. Choosing a page at random.

A student buys a brand new calculus textbook that has 1000 pages, each numbered with 3 digits, from 000 to 999. She randomly opens the book to a page and starts to read! Assume that any of the 1000 pages are equally likely to be chosen.

Let B be the event that *at least one* of the digits on the chosen page is a “5” (for example, the page could be 572 or 505 or 355 or 115 etc., etc.). Let C be the event that *at least two* of the digits on the chosen page are “5” (for example, 355 or 575, etc.).

(a.) Given that B occurs, find the conditional probability of A , the event that 555 is the selected page.

(b.) Given that C occurs, find the conditional probability of A , the event that 555 is the selected page.

2. Gloves. A matching pair of blue gloves, a matching pair of red gloves, and one lone white right-handed glove are in a drawer.

Suppose that a person is looking for the two matching blue gloves. He blindly pulls two gloves out of the drawer simultaneously. Let B be the event that *at least one* of the gloves is blue.

(a.) Given that B occurs, find the conditional probability of A , the event that both of the gloves are blue.

(b.) Given that B occurs, find the conditional probability of A^c .

3. Seating arrangements. Alice, Bob, Catherine, Doug, and Edna are randomly assigned seats at a circular table in a perfectly circular room. Assume that rotations of the table do not matter, so there are exactly 24 possible outcomes in the sample space.

Bob and Catherine are married. Doug and Edna are married. When people are married they love to sit beside each other.

Let B denote the event that Bob and Catherine are sitting next to each other. Given that B occurs, find the conditional probability of A , the event that Doug and Edna are sitting next to each other.

4. Pair of dice. Roll a pair of dice. Let B be the event that the two dice have different values. Given that B occurs, find the conditional probability of A , the event that the sum of the dice is an even number.

5. Pair of dice. Roll a pair of dice. Let B be the event that the sum of the pair of dice is 9 or larger. Given that B occurs, find the conditional probability of A , the event that the sum of the pair of dice is exactly 10.