Problem

A bag contains 3 red marbles and 4 blue marbles. Then, 2 marbles are drawn from the bag, at random, without replacement. If the first marble drawn is red, what is the probability that the second marble is blue?

Solution

There are 13 cards of each suit in a deck.

Let's consider events:

- A - first marble is Red

- B - second marble is Blue

After drawing the first marble, we are left with 2 red marbles and 4 blue marbles.

$$P(B) = \frac{\# \, of \, blue \, marbles}{total \, \# \, of \, marbles} = \frac{4}{6} = \frac{2}{3}$$