Answer on Question#40079, Math, Other

Two cards are drawn from a pack of deck cards and thrown, after this two more cards drawn together, what is the possibility that both cards have same value?

Solution:

In this task we have to compute the probability of an event given that another event has occurred.

According to the condition of our problem two cards were taken from a deck of cards and thrown. As we previously marked two cards have been removed from the deck of cards, respectively left 50. We have to find the possibility that both cards have same value. To solve this task we apply the formula for the number of combinations is shown below where C_n^m is the number of combinations for n things taken r at a time.

$$C_n^m = \frac{n!}{(n-m)!\,m!}$$

Let H_1 is the event that the cards which was thrown have different value. And H_2 is the event that the cards which was thrown have the same value. Then

$$P(H_1) = \frac{C_{13}^2 C_4^1 C_4^1}{C_{52}^2} = \frac{16}{17},$$

$$P(H_2) = \frac{C_{13}^1 C_4^2}{C_{52}^2} = \frac{1}{17}.$$

A is the event that the next two cards have the same value. The conditional probabilities for these cases are

$$P(A|H_1) = \frac{C_{11}^1 C_4^2 + 2C_3^2}{C_{50}^2} \approx 0.06,$$

$$P(A|H_1) = \frac{C_{11}^1 C_4^2 + 2C_3^2}{C_{50}^2} \approx 0.06.$$

Using Bayes formula we get

$$P(A) = P(A|H_1)P(H_1) + P(A|H_1)P(H_2) \approx 0.06$$

Answer: $P = 0.06.$