Answer on Question #39496 – Math – Statistics and Probability

An urn A contains 2 white & 4 black balls. Another urn B contains 5 white & 7 black balls. A ball is transferred from urn A to urn B, then a ball is drawn from urn B. Find the probability that it is white.

Solution.

Let A, B, C be three events:

$$A = \{the\ second\ ball\ is\ white\};$$

$$B = \{the\ first\ ball\ is\ white\};$$

$$C = \{the\ first\ ball\ is\ black\};$$

We need to find $P(A)$. Hence:

$$P(B) = \frac{2}{6} = \frac{1}{3};$$

$$P(C) = \frac{4}{6} = \frac{2}{3};$$

$$P(A|B) = \frac{6}{13};$$

$$P(A|C) = \frac{5}{13};$$

$$P(A) = P(A \cap B) + P(A \cap C) = P(A|B)P(B) + P(A|C)P(C) = \frac{6}{13} \cdot \frac{1}{3} + \frac{5}{13} \cdot \frac{2}{3} = \frac{16}{39}.$$

Answer.

16/39