

Answer on Question #45626 – Math – Statistics and Probability

Question.

One bag contains 4 white balls and 3 black balls and a second bag contains 3 white balls and 5 black balls. One ball is drawn from the first bag and placed unseen in second bag. What is the probability that a ball now drawn from the second bag is black?

Solution.

Let event H_1 – white ball is drawn from the first bag, H_2 – black ball is drawn from the first bag, A – black ball is drawn from the second bag after passing the ball from the first bag to the second bag. Then $P(H_1) = \frac{4}{7}$, $P(H_2) = \frac{3}{7}$, $P(A/H_1) = \frac{5}{9}$, $P(A/H_2) = \frac{6}{9} = \frac{2}{3}$. We use the formula of total probability:

$$P(A) = P(A/H_1) \cdot P(H_1) + P(A/H_2) \cdot P(H_2) = \frac{5}{9} \cdot \frac{4}{7} + \frac{2}{3} \cdot \frac{3}{7} = \frac{38}{63}.$$

Answer. $\frac{38}{63}$.