

Answer on Question #76848 – Math – Statistics and Probability

Question

Two balls of same colour are put into second box from first box. Then a ball is raised from the second box and it is seen red. What is the probability that the red ball was in the first box?

Solution

The probability that the red ball was in the first box:

$$P = P_1 \cdot P_2$$

where P_1 is probability that balls taken from the first box are red, P_2 is probability that the red ball taken from the second box was in the first box (if balls taken from the first box are red).

$$P_1 = \frac{N_{1r}}{N_1} \cdot \frac{N_{1r} - 1}{N_1 - 1}$$

where N_1 is the total number of balls in the first box before 2 balls were taken, N_{1r} is the number of red balls in the first box before 2 balls were taken.

$$P_2 = \frac{2}{N_{2r}}$$

where N_{2r} is the number of red balls in the second box after 2 balls were put into.

Answer: $P = \frac{N_{1r}}{N_1} \cdot \frac{N_{1r}-1}{N_1-1} \cdot \frac{2}{N_{2r}}$