

Answer on Question #79228 – Math – Statistics and Probability

Question

60% of the players at a Spanish football club are local. Past experience has shown that 10% of local players have disciplinary issues and are suspended during a season, while 20% of overseas players have disciplinary issues leading to suspension. A player has just been suspended due to ill-discipline. Determine the probability that this player was from overseas

Solution

Let event A denote being from overseas, event B mean being suspended.

Events A and B are not independent.

Probability of being from overseas:

$$P(A) = 1 - 0.6 = 0.4.$$

Probability of being local:

$$P(\bar{A}) = 0.6.$$

Probability of being suspended given that the player was from overseas:

$$P(B|A) = 0.2$$

Probability of being suspended given that the player was local:

$$P(B|\bar{A}) = 0.1$$

Probability of being from overseas and suspended:

$$P(A \cap B) = P(A) \cdot P(B|A) = 0.4 \cdot 0.2 = 0.08.$$

Probability of being suspended:

$$P(B) = P(A) \cdot P(B|A) + P(\bar{A})P(B|\bar{A}) = 0.4 \cdot 0.2 + 0.6 \cdot 0.1 = 0.14.$$

Probability that the player was from overseas given the player has just been suspended

$$P(A|B) = \frac{P(A \cap B)}{P(B)} = \frac{0.08}{0.14} = \frac{4}{7} \approx 0.5714.$$

Answer: $\frac{4}{7} \approx 0.5714$.