

Esercizio 3

sabato 8 maggio 2021 20:00

19:29

$$P(A) = \frac{1}{5}$$

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

$$P(A \cup B) = \frac{3}{5}$$

$$P(A \cap B) = ?$$

$$\begin{aligned} P(A \cap B) &= P(A) + P(B) - P(A \cup B) \\ &= \frac{1}{5} + \frac{1}{2} - \frac{3}{5} = \frac{2+5-6}{10} = \frac{1}{10} \end{aligned}$$

$$P(A \cap B) = \frac{1}{10}$$

① Sono indipendenti?

$$P(A \cap B) = P(A) \cdot P(B)$$

$$P(A) \cdot P(B) = \frac{1}{5} \cdot \frac{1}{2} = \frac{1}{10}$$

$$P(A \cap B) = \frac{1}{10}$$

A e B Sono indipendenti

② Essendo A e B indipendenti, lo sono anche i complementi

$$\bullet P(A \cap \bar{B}) = P(A) \cdot P(\bar{B}) = \frac{1}{5} \cdot \frac{1}{2} = \frac{1}{10}$$

$$\bullet P(\bar{A} \cap B) = P(\bar{A}) \cdot P(B) = \frac{4}{5} \cdot \frac{1}{2} = \frac{4}{10} = \frac{2}{5}$$

$$\bullet P(\bar{A} \cap \bar{B}) = P(\bar{A}) \cdot P(\bar{B}) = \frac{4}{5} \cdot \frac{1}{2} = \frac{4}{10} = \frac{2}{5}$$

③ $P(\bar{A} \cup \bar{B}) = 1 - P(A) \cdot P(B)$

$$= 1 - \frac{1}{5} \cdot \frac{1}{2}$$

$$= 1 - \frac{1}{10}$$

$$\text{oppure} \quad = \frac{9}{10}$$

$$\begin{aligned} P(\bar{A} \cup \bar{B}) &= [P(\bar{A}) + P(\bar{B}) - P(\bar{A} \cap \bar{B})] \\ &= \frac{4}{5} + \frac{1}{2} - \frac{2}{5} = \frac{8+5-4}{10} = \frac{9}{10} \end{aligned}$$