

If A and B are two independent events with $P(A) = \frac{3}{5}$ and $P(B) = \frac{4}{9}$,

then $P(A' \cap B')$ equals to

(a) $\frac{4}{15}$

(b) $\frac{8}{45}$

(c) $\frac{1}{3}$

(d) $\frac{2}{9}$

$$P(A' \cap B') = 1 - P(A \cup B)$$

$$= 1 - [P(A) + P(B) - P(A \cap B)]$$

$$= 1 - \left[\frac{3}{5} + \frac{4}{9} - \frac{3}{5} \times \frac{4}{9} \right]$$

$$[\because P(A \cap B) = P(A) \cdot P(B)]$$

$$= 1 - \left[\frac{27 + 20 - 12}{45} \right] = 1 - \frac{35}{45} = \frac{10}{45} = \frac{2}{9}$$