

Chapter-13 Probability

Excercise-3

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Question 12.13.5.6: If A and B are two independent events with $\Pr(A) = \frac{3}{5}$ and $\Pr(B) = \frac{4}{9}$ then, $\Pr(A'B')$

- 1) $\frac{4}{15}$
- 2) $\frac{8}{45}$
- 3) $\frac{1}{3}$
- 4) $\frac{2}{9}$

Solution: Using de morgan's law and axioms of probability,

$$\Pr(A'B') = \Pr((A + B)') \quad (1)$$

$$\Pr(A + B) = \Pr(A) + \Pr(B) - \Pr(AB) \quad (2)$$

Also, As A and B are independent,

$$\Pr(AB) = \Pr(A) \Pr(B) \quad (3)$$

Now,using the equations of (1), (2) and (3)

$$\Pr(A'B') = \Pr((A + B)') \quad (4)$$

$$= 1 - \Pr((A + B)) \quad (5)$$

$$= 1 - \Pr(A) - \Pr(B) + \Pr(A) \Pr(B) \quad (6)$$

$$= 1 - \left(\frac{3}{5}\right) - \left(\frac{4}{9}\right) + \left(\frac{3}{5}\right)\left(\frac{4}{9}\right) \quad (7)$$

$$= \frac{2}{9} \quad (8)$$

so option (4) is correct