

ASSIGNMENT 1

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Q.11.13.3.15

If E and F are events such that $\Pr(E) = \frac{1}{4}$, $\Pr(F) = \frac{1}{2}$ and $\Pr(EF) = \frac{1}{8}$, find

(i) $\Pr(E + F)$

(ii) $\Pr(E'F')$

solution:

(i) $\Pr(E + F)$

For given two events E and F , we know that,

$$(E + F) = E + F - EF \quad (1)$$

$$\Pr(E + F) = \Pr(E) + \Pr(F) - \Pr(EF) \quad (2)$$

$$\Rightarrow \Pr(E + F) = \frac{1}{4} + \frac{1}{2} - \frac{1}{8} \quad (3)$$

$$= \frac{5}{8} \quad (4)$$

$$\therefore \Pr(E + F) = \frac{5}{8} \quad (5)$$

(ii) $\Pr(E'F')$

For given two events E and F , we know that,

$$(E'F') = (E + F)' \quad (6)$$

$$\Pr(E'F') = \Pr((E + F)') \quad (7)$$

$$\Rightarrow \Pr(E'F') = 1 - \Pr(E + F) \quad (8)$$

$$\Rightarrow \Pr(E'F') = 1 - \frac{5}{8} \quad (9)$$

$$= \frac{3}{8} \quad (10)$$

$$\therefore \Pr(E'F') = \frac{3}{8} \quad (11)$$