

NCERT: Class XI

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16.4.7 ¹ A and B are two events such that $\Pr(A) = 0.54$, $\Pr(B) = 0.69$ and $\Pr(AB) = 0.35$. Find

(a) $\Pr(A + B)$

(b) $\Pr(A'B')$

(c) $\Pr(AB')$

(d) $\Pr(A'B)$

Solution:

(a) By addition theorem of probability, we know that

$$\Pr(A + B) = \Pr(A) + \Pr(B) - \Pr(AB) \quad (16.4.1.1)$$

$$= 0.54 + 0.69 - 0.35 \quad (16.4.1.2)$$

$$= 0.88 \quad (16.4.1.3)$$

(b)

$$\Pr(A'B') = \Pr((1 - A)(1 - B)) \quad (16.4.2.4)$$

$$= \Pr((1 - A - B + AB)) \quad (16.4.2.5)$$

$$= \Pr((1 - (A + B - AB))) \quad (16.4.2.6)$$

$$= 1 - \Pr((A + B)) \quad (16.4.2.7)$$

$$= 1 - 0.88 \quad (16.4.2.8)$$

$$= 0.12 \quad (16.4.2.9)$$

(c)

$$\Pr(AB') = \Pr((A)(1 - B)) \quad (16.4.3.10)$$

$$= \Pr(A - AB) \quad (16.4.3.11)$$

$$= \Pr(A) - \Pr(AB) \quad (16.4.3.12)$$

$$= 0.54 - 0.35 \quad (16.4.3.13)$$

$$= 0.19 \quad (16.4.3.14)$$

¹Read question numbers as (CHAPTER NUMBER).(EXERCISE NUMBER).(QUESTION NUMBER)

(d) Similarly,

$$\Pr(A'B) = \Pr((1 - A)(B)) \quad (16.4.4.15)$$

$$= \Pr(B - AB) \quad (16.4.4.16)$$

$$= \Pr(B) - \Pr(AB) \quad (16.4.4.17)$$

$$= 0.69 - 0.35 \quad (16.4.4.18)$$

$$= 0.34 \quad (16.4.4.19)$$