

Exemplar - 12.13.3.3

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Question: The probability that at least one of the two events A and B occurs is 0.6. If A and B occur simultaneously with probability 0.3, evaluate $\Pr(A') + \Pr(B')$.

Solution: Given:

$$\Pr(AB) = 0.3 \quad (1)$$

$$\Pr(A + B) = 0.6 \quad (2)$$

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

$$\implies 0.6 = \Pr(A) + \Pr(B) - 0.3 \quad (4)$$

$$\implies 0.9 = \Pr(A) + \Pr(B) \quad (5)$$

But

$$\Pr(A') = 1 - \Pr(A) \quad (6)$$

$$\Pr(B') = 1 - \Pr(B) \quad (7)$$

$$\therefore \Pr(A') + \Pr(B') = 2 - (\Pr(A) + \Pr(B)) \quad (8)$$

$$= 2 - 0.9 \quad (9)$$

$$= 1.1 \quad (10)$$