Q-11.16.3.41

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The probability of happening of an event A is 0.5 and that of B is 0.3. If A and B are mutually exclusive events, then the probability of neither A nor B is _____.

Solution: Given:

$$Pr(A) = 0.5 \tag{1}$$

$$Pr(B) = 0.3 \tag{2}$$

As A and B are mutually exclusive,

$$Pr(AB) = 0 \tag{3}$$

Probability of atleast one of A and B happening is given by:

$$Pr(A + B) = Pr(A) + Pr(B) - Pr(AB) \tag{4}$$

$$= 0.5 + 0.3 - 0 \tag{5}$$

$$= 0.8 \tag{6}$$

$\therefore$ probability of neither A nor B happening is:

$$Pr((A + B)') = 1 - Pr(A + B) \tag{7}$$

$$= 1 - 0.8 \tag{8}$$

$$= 0.2 \tag{9}$$