

ASSIGNMENT-1 PROBABILITY

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Question 12.13.3.65

You are given that A and B are two events such that $\Pr(B) = \frac{3}{5}$, $\Pr(A | B) = \frac{1}{2}$, $\Pr(A + B) = \frac{4}{5}$ and $\Pr(A) = \frac{1}{2}$. $\Pr(B | A')$ is equal to

Solution: You are given that events A and B have the following probabilities:

$$\Pr(B) = \frac{3}{5} \quad (1)$$

$$\Pr(A | B) = \frac{1}{2} \quad (2)$$

$$\Pr(A + B) = \frac{4}{5} \quad (3)$$

$$\Pr(A) = \frac{1}{2} \quad (4)$$

$$\Pr(B | A') = \frac{\Pr(A' | B) \Pr(B)}{\Pr(A')} \quad (5)$$

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

$$= 1 - \frac{1}{2} \quad (7)$$

$$= \frac{1}{2} \quad (8)$$

$$\Pr(A' | B) = 1 - \Pr(A | B) \quad (9)$$

$$= 1 - \frac{1}{2} \quad (10)$$

$$= \frac{1}{2} \quad (11)$$

$$\Pr(B | A') = \frac{\Pr(A' | B) \Pr(B)}{\Pr(A')} \quad (12)$$

$$= \frac{\left(\frac{1}{2}\right)\left(\frac{3}{5}\right)}{\frac{1}{2}} \quad (13)$$

$$= \frac{\frac{3}{10}}{\frac{1}{2}} \quad (14)$$

$$= \frac{\frac{3}{10}}{\frac{5}{10}} \quad (15)$$

$$= \frac{3}{5} \quad (16)$$