ASSIGNEMNT-1 PROBABILITY

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Question 12.13.3.65

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

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

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

$$\Pr(A \mid B) = \frac{1}{2} \tag{2}$$

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

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

$$\Pr(B \mid A') = \frac{\Pr(A' \mid B)\Pr(B)}{\Pr(A')} \tag{5}$$

$$\Pr(A') = 1 - \Pr(A) \tag{6}$$

$$= 1 - \frac{1}{2} \tag{7}$$

$$= \frac{1}{2} \tag{8}$$

$$\Pr(A' \mid B) = 1 - \Pr(A \mid B) \tag{9}$$

$$= 1 - \frac{1}{2} \tag{10}$$

$$= \frac{1}{2} \tag{11}$$

$$\Pr(B \mid A') = \frac{\Pr(A' \mid B)\Pr(B)}{\Pr(A')} \tag{12}$$

$$= \frac{\frac{1}{2} \cdot \frac{3}{5}}{\frac{1}{2}} \tag{13}$$

$$= \frac{\frac{3}{10}}{\frac{1}{2}} \tag{14}$$

$$= \frac{\frac{3}{10}}{\frac{5}{10}} \tag{15}$$

$$= \frac{3}{5} \tag{16}$$