Question 12.13.3.8
Probability and Random Processes

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Question:12/13/3/8

Three events A, B and C have probabilities $\frac{2}{5},\frac{1}{3}$ and $\frac{1}{2}$ respetively.Given that $\Pr(AC)=\frac{1}{5}$ and $\Pr(BC)=\frac{1}{4}$,find the values of $\Pr(C|B)$ and $\Pr(A'C')$

Solution:

1) $\Pr(C|B)$

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

$$= \frac{\frac{1}{4}}{\frac{1}{3}} \tag{2}$$

$$= \frac{3}{4} \tag{3}$$

2) $\Pr(A'C')$

$$= \Pr\left((A+C)'\right) \tag{4}$$

$$= 1-\Pr(A+C) \tag{5}$$

$$= 1-(\Pr(A)+\Pr(C)-\Pr(AC)) \tag{6}$$

$$= 1-\left(\frac{2}{5}+\frac{1}{2}-\frac{1}{5}\right) \tag{7}$$

$$= 1-\frac{7}{10} \tag{8}$$

$$= \frac{3}{10} \tag{9}$$