Assignment 1

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Question:- If A and B are two events such that P(A) = 1/4, P(B) = 1/2 and P(AB) = 1/8, find P(not A and not B).

Solution:-

A and B are two events.

Given,

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

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

$\Pr(AB)$ = Probability of occuring both A and B $= \frac{1}{8}$

So, $\Pr(A'B') = \Pr((A+B)')$
[By using De-Morgan's Law]

$$= 1 - \Pr(A+B) \tag{3}$$

$$= 1 - [\Pr(A) + \Pr(B) - \Pr(AB)] \tag{4}$$

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

$$= 1 - \frac{1}{4} - \frac{1}{2} + \frac{1}{8} \tag{6}$$

$$= 1 - \frac{5}{8} = \frac{3}{8} \tag{7}$$

So, Answer:- $\Pr(A'B') = \frac{3}{8}$