Assignment 6

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Question: If P(A) = 1/2, P(B) = 0, then P (A/B) is

1) 0
2) 1/2
3) not defined
4) 1

Solution: If X and Y are two events in a sample space S, then The Conditional Probability of X given Y is defined as

$$\Pr\left(X \mid Y\right) = \frac{\Pr\left(X \cap Y\right)}{\Pr\left(Y\right)} \tag{1}$$

Given, A and B are the events such that :

Probability	**Value**
$\Pr\left(A\right)$	$\frac{1}{2}$
$\Pr\left(B\right)$	0
$\Pr\left(A \mid B\right)$	$?$

TABLE I
GIVEN DATA

Using (1),

$$\Pr\left(A \mid B\right) = \frac{\Pr\left(A \cap B\right)}{\Pr\left(B\right)} \tag{2}$$

$$\implies \Pr\left(A \mid B\right) = \frac{\Pr\left(A \cap B\right)}{0} \tag{3}$$

$$\implies \boxed{\Pr\left(A \mid B\right) \text{ = not defined}} \tag{4}$$