PROBABILITY

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The random variable X has a probability distribution P(X) of the following form.where k is some number:

a) $P(A|B) = \frac{P(B)}{P(A)}$ b)$P(A|B) < P(A)$

c)$P(A|B) \geqq P(A)$ d)None of these

Given: A $\subset$ B and P(B) $\neq$ 0
solution
if A $\subset$ B and P(B)$\neq$ 0 then

$$\Rightarrow \text{A} \cap \text{B} = \text{A}$$
$$\text{also P(A)} < \text{P(B)}$$
$$P(A|B) = \frac{P(A \cap B)}{P(B)} = \frac{P(A)}{P(B)} \tag{1}$$

we know that

$$1 \leq \frac{1}{P(B)}$$

multiply both sides with P(A),we get

$$\text{P(A)} \leq \frac{P(A)}{P(B)}$$

from the above eq 10

$$\text{P(A)} \leq \text{P(A|B)}$$
$$\boxed{P(A \mid B) \geq P(A)} \tag{2}$$