AI1103 - Assignment 3

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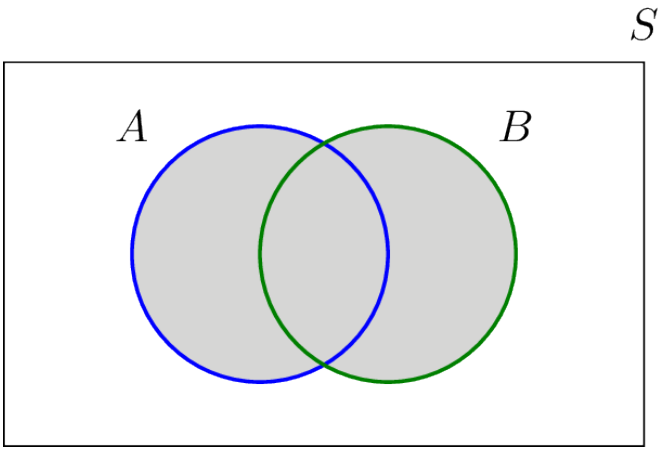
QUESTION:

If A and B are two events and the probability $\Pr(B) \neq 1$,then $\frac{\Pr(A)-\Pr(AB)}{1-\Pr(B)}$ equals

1) $\Pr\left(\frac{A}{\bar{B}}\right)$
2) $\Pr\left(\frac{A}{B}\right)$
3) $\Pr\left(\frac{\bar{A}}{B}\right)$
4) $\Pr\left(\frac{\bar{A}}{\bar{B}}\right)$

ANSWER:



From the figure

$$S - B = \bar{B} \tag{0.0.1}$$
$$A - (AB) = A\bar{B} \tag{0.0.2}$$

So from these equations we get,

1) 1 - $\Pr(B)$ = $\Pr\left(\bar{B}\right)$
2) $\Pr(A)$ - $\Pr(AB)$ = $\Pr\left(A\bar{B}\right)$

using these

$$\frac{\Pr(A)-\Pr(AB)}{1-\Pr(B)} = \frac{\Pr\left(A\bar{B}\right)}{\Pr\left(\bar{B}\right)} \tag{0.0.3}$$
$$= \Pr\left(\frac{A}{\bar{B}}\right) \tag{0.0.4}$$

Hence, option (1) is correct.