Probabilidades

Ejercicio 3.

Probabilidades

Dados los sucesos A y B tales que $P(A) > 0$ y $P(B|A) > 0$. Demuéstrese que:

$$P(B|A) > 1 - \frac{P(B^C)}{P(A)}$$

$P(A \cup B) = P(A) + P(B) - P(A \cap B)$

$P(A^c) = 1 - P(A)$

$P(A) = 1 - P(A^c)$

$P(A \cup B) = P(A) + P(B) - P(A \cap B)$

$\underline{P(A \cup B)} = 1 - P(A^c) + 1 - P(B^c) - \underline{P(A \cap B)}$

$P(A \cap B) = 1 - P(A^c) + 1 - P(B^c) - P(A \cup B)$

$P(A \cap B) = [1 - P(A^c) - P(B)] + [1 - P(A \cup B)]$

$$P(A\cap B) = \left[1 - P(A^c) - P(B^c)\right] + \underbrace{P((A\cup B)^c)}_{\geq 0}.$$

$$P(A\cap B) \geq \underbrace{1 - P(A^c)} - P(B^c)$$

$$P(A\cap B) \geq P(A) - P(B^c)$$

Formula Prob. Condicional:

$$P(B|A) = \frac{P(A\cap B)}{P(A)} \geq \frac{P(A) - P(B^c)}{P(A)}$$

$$P(B|A) \geq 1 - \frac{P(B^c)}{P(A)}.$$