a)

The Morgan's laws state that given two events A and B from the same sample space, $\overline{A \cup B} = \overline{A} \cap \overline{B}$ and $\overline{A \cap B} = \overline{A} \cup \overline{B}$. Proof both assertions graphically using Venn diagrams.

b)

Let A and B be two events of a same sample space, such that $P(A) = 3/8$, $P(B) = 1/2$ and $P(A \cap B) = 1/4$. Compute the following probabilities:

(a) $P(A \cup B)$.
(b) $P(\overline{A})$ and $P(\overline{B})$.
(c) $P(\overline{A} \cap \overline{B})$.
(d) $P(A \cap \overline{B})$.
(e) $P(A|B)$.
(f) $P(A|\overline{B})$.

c)

Let A and B be two events of a same sample space, such that $P(A) = 0.6$ and $P(A \cup B) = 0.9$. Compute $P(B)$ under the following assumptions:

(a) A and B are incompatible.
(b) A and B are independent.

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a)

Las leyes de Morgan establecen que dados dos sucesos aleatorios A y B de un mimo espacio muestral, $\overline{A \cup B} = \bar{A} \cap \bar{B}$ y $\overline{A \cap B} = \bar{A} \cup \bar{B}$. Demostrar ambas igualdades usando diagramas de Venn.

b)

Sean A y B sucesos de un mismo espacio muestral tales que: $P(A) = 3/8$, $P(B) = 1/2$, $P(A \cap B) = 1/4$. Calcular:

a) $P(A \cup B)$.
b) $P(\overline{A})$ y $P(\overline{B})$.
c) $P(\overline{A} \cap \overline{B})$.
d) $P(A \cap \overline{B})$.
e) $P(A/B)$.
f) $P(A/\overline{B})$.

c)

Sean A y B sucesos de un mismo espacio muestral, tales que $P(A) = 0{,}6$ y $P(A \cup B) = 0{,}9$. Calcular $P(B)$ si:

a) A y B son incompatibles.
b) A y B son independientes.