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Assignment-5

1) a) Given,

$$P(A) = 0.3 \quad P(B) = 0.5$$

$$P(A \cup B) = P(A) + P(B) = 0.3 + 0.5 = 0.8$$

b) Hence, $P(A - B) = P[A - (A \cap B)] = P(A - 0) = P(A) = 0.3$

c) $P(A \cap B) = 0$. Because A and B are mutually exclusive.

$$2) a) P(A|D) = \frac{P(D \cap A)}{P(D)} = \frac{0.78}{0.83} = 0.94$$

$$b) P(D|A) = \frac{P(D \cap A)}{P(A)} = \frac{0.78}{0.82} = 0.95$$

$$3) \text{ Hence, } P(F_2 \cap F_1) = P(F_2 | F_1) \times P(F_1) = \frac{4}{19} \times \frac{5}{20} = \frac{1}{19}$$

$$4) P(M|S) = \frac{P(M \cap S)}{P(S)} = \frac{28/200}{78/200} = \frac{28}{78}$$

$$\underline{b)} P(e' | F) = \frac{P(e' \cap F)}{P(F)} = \frac{95/200}{112/200} = \frac{95}{112}$$

5 a Given,

$$P(A) = 0.3 \quad P(B) = 0.2$$

$$\therefore P(A \cup B) = P(A) + P(B) = 0.5$$

b We know,

$$\text{Total probability} = 1$$

$$\begin{aligned} \therefore \text{Prob } P(\text{Neither A nor B}) &= 1 - P(A \cup B) \\ &= 1 - 0.5 \\ &= 0.5 \end{aligned}$$