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1. Given that E and F are events such that P (E) = 0.6, P (F) = 0.3 and P (E ∩ F) = 0.2, find P (E|F) and P (F|E)

Solution:

Given P (E) = 0.6, P (F) = 0.3 and P (E ∩ F) = 0.2

We know that by the definition of conditional probability,

$$P(A|B) = \frac{P(A \cap B)}{P(B)}$$

By substituting the values we get

$$\Rightarrow P(E|F) = \frac{P(E \cap F)}{P(F)} = \frac{0.2}{0.3} = \frac{2}{3}$$

And $\Rightarrow P(F|E) = \frac{P(E \cap F)}{P(E)} = \frac{0.2}{0.6} = \frac{2}{6} = \frac{1}{3}$

2. Compute P (A|B), if P (B) = 0.5 and P (A ∩ B) = 0.32

Solution:

Given: P (B) = 0.5 and P (A ∩ B) = 0.32

We know that by definition of conditional probability,

$$P(A|B) = \frac{P(A \cap B)}{P(B)}$$

Now by substituting the values we get

$$\Rightarrow P(A|B) = \frac{0.32}{0.5} = \frac{32}{50} = \frac{16}{25}$$

3. If P (A) = 0.8, P (B) = 0.5 and P (B|A) = 0.4, find
(i) P (A ∩ B)

(ii) P (A|B)

(iii) P (A ∪ B)