

Conditional Probability:

الاحتمال الشرطي

we say that the event A conditional on B (denoted by A/B). The Conditional prob. of A given B is given by :-

$$P(A/B) = \frac{P(A \cap B)}{P(B)} ; P(B) > 0$$

and

$$P(B/A) = \frac{P(A \cap B)}{P(A)} ; P(A) > 0$$

Notes: if A & B are indep. events, then.

$$1 - P(A/B) = P(A)$$

$$\Rightarrow \therefore P(A/B) = \frac{P(A \cap B)}{P(B)} = \frac{P(A) \cdot P(B)}{P(B)} = P(A)$$

$$2 - P(B/A) = P(B)$$

$$\Rightarrow \therefore P(B/A) = \frac{P(A \cap B)}{P(A)} = \frac{P(A) \cdot P(B)}{P(A)} = P(B)$$

Example: 3 a's and 2 b's are arranged in a row, find the prob. that 2 b's come together knowing that the first letter is a.

$$(i.e.) : P(A/B)$$