CONDITIONS & PROBABILITIES

P(H)

CONDITIONAL PROBABILITY

probabilities really are conditioned on information

$P(j \mid k) = n_{j \text{ and } k} / n_k$
read as 'Probability for j given k'

if two dice are tossed, then a convenient graphical analysis may be used to calculate ns

$P(j \mid k) = n_{j \text{ and } k} / n_k$

P(7 or 9 sum | second die yields 2 or 3)

$n_{7 \text{ or } 9 \text{ and second die yields 2 or 3}} = 3$

$n_{\text{second die yields 2 or 3}} = 12$

P(7 or 9 sum | second die yields 2 or 3) = 3 / 12 = 1 / 4

$P(j \mid k) = n_{j \text{ and } k} / n_k$

$= (n_{j \text{ and } k} / n) / (n_k / n)$

$= P(j \text{ and } k) / P(k) = (1 / 12) / (1 / 3)$

if j and k are independent, then the unconditioned multiplication rule is recovered

GENERAL PROBABILITY RULES

P(j and k) = P(j | k) P(k)

P(j or k) = P(j) + P(k) - P(j and k)