Let $A_1, \ldots, A_n$ be a partition of a sample space where $P(A_i) > 0$ for all i. Let B be an event with $P(B) > 0$. Then

$$P(A_i \mid B) = \frac{P(B \mid A_i)P(A_i)}{P(B \mid A_1)P(A_1) + \cdots + P(B \mid A_n)P(A_n)}$$