The concept of setminus: For example, the notation $B \setminus A = B \cap A^c$

The concept of partition of the sample space: We say that A_1, A_2, ..., A_k form a partition of the sample space S if

$$A_1 \cup A_2 \cup \cdots \cup A_k = S$$

and (also) the A_j's are disjoint.

In particular, if $k = 2$, notice that a partition must just have the form $A \cup A^c = S$.

The complement of an event A always has probability $1 - P(A)$, i.e.,

$$P(A^c) = 1 - P(A)$$

Why? First write

$$1 = P(S) = P(A \cup A^c)$$

but A and A^c are disjoint, so $P(A \cup A^c) = P(A) + P(A^c)$. So $1 = P(A) + P(A^c)$, and subtract $P(A)$ on both sides, $P(A^c) = 1 - P(A)$.

If we have events A and B such that $A \subset B$, i.e., such that every outcome of A is also in B as well, then $P(A) \leq P(B)$. Why? Write $B = A \cup (B \setminus A)$. Also A and $B \setminus A$ are two disjoint events. So now we have $B = A \cup (B \setminus A)$ is a disjoint union. So we get

$$P(B) = P(A) + P(B \setminus A) \geq P(A)$$

because $P(B \setminus A) \geq 0$, because all probabilities are always 0 or bigger. So we conclude: If $A \subset B$ then $P(A) \leq P(B)$.