

ST102 Week 6

Def. Probability function $p(x)$, $x \in \mathcal{D}$

Def. (Expectation)

$$E[g(X)] = \sum_{x \in \mathcal{D}} g(x) p(x)$$

→ prob. function of X

Important: manually define some helper random variables in the solution

Axioms of probability

1) $P(A) \geq 0$, \forall event A

2) $P(S) = 1$

3) For a seq. of pairwise disjoint $\{A_i\}_i^{\infty}$

(i.e. $A_i \cap A_j = \emptyset$, $\forall i \neq j$)

$$P\left(\bigcup_{i=1}^{\infty} A_i\right) = \sum_{i=1}^{\infty} P(A_i)$$