

Probability and Random Variables

Assignment 3

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May 31, 2022

Outline

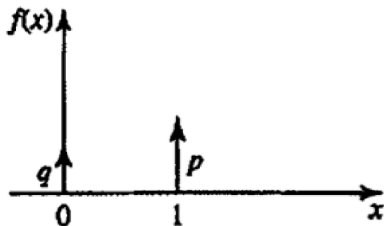
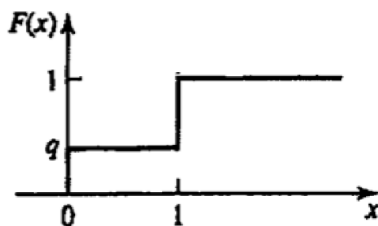
1 Problem

2 Solution

Problem

In the coin-tossing experiment, the probability of heads equals p and the probability of tails equals q . We define the random variable x such that $x(h)=1$, $x(t)=0$. We shall find its distribution function $F(x)$ for every x' from $-\infty$ to ∞ .

Solution



If $x \geq 1$, then $x(h)=1$ and $x(t)=0 \leq x$.

Hence $F(x)=P\{x \leq x\} = P(h,t)=1$, $x \geq 1$

If $0 \leq x \leq 1$, then $x(h)=1$ and $x(t)=0 \leq x$. Hence

$F(x)=P\{x \leq x\} = P\{t\}=q$, $0 \leq x \leq 1$.

If $x < 0$, then $x(h)=1 > x$ and $x(t)=0 > x$. Hence,

$F(x)=P\{x \leq x\}=P\theta = 0$, $x < 0$