Probability and Random Variables

Assignment 3

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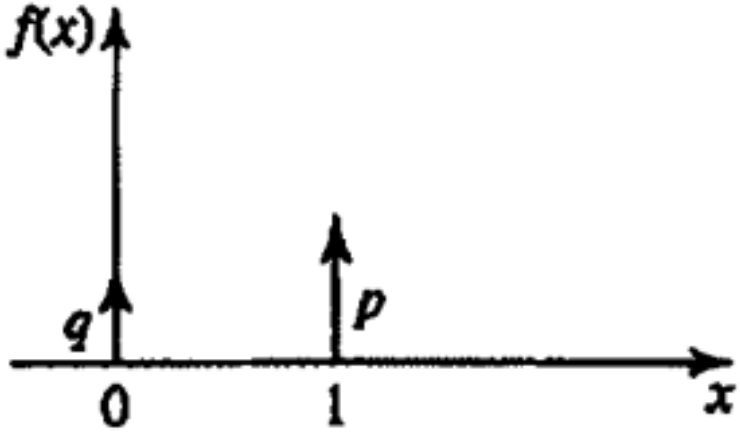
Outline

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 it's distribution function F(x) for every x' from $-\infty$ to ∞.

Solution



If $x \geq 1$, then x(h)=1 x 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$\theta\}$ = $0, x < 0$