张 颢 (濯).
清华 电子系 Rohm 11-105.
hawzhang@tsinghua.edu.cn
13301383501 微信

Prerequisite:
Calculus. (Working knowledge)
Linear Algebra.
Probability. Linear Systems

Textbook and Reference
陆大绘 张颢: 随机过程及其应用 (1986) (2012).
A. Papoulis: Probability, Random Variables and Stochastic Processes. "Cited Classic"
Fourth Edition
S. Ross. Stochastic Processes. Second Edition

Homework and Exam.
100. = 10 + 30 + 60 Taste.
(Projects) (Final) Open Book
1 of 3 6 of 10
3 Problems per week Electronic Version

Stochastic Processes.
(Random).

X : Random Variable. $\Omega \to \mathbb{R}$. deterministic.

Statistical Experiment $\Rightarrow$ Sample Points.

$P: 2^{\Omega} \to \mathbb{R}_+$. Random Variables $\Leftarrow$ Sample Space

Possibility.

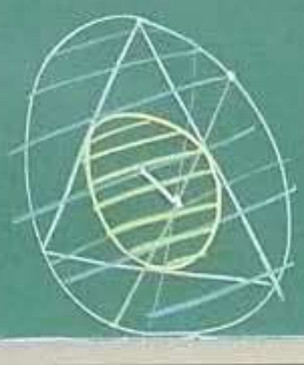
Distribution Functions.

$F_X(x) = P(X \leq x) = P(X \in (-\infty, x])$. $\forall p \in (0,1)$

$= P(\{\omega \in \Omega : X(\omega) \leq x\})$ Bertrand Paradox.

Equiprobable

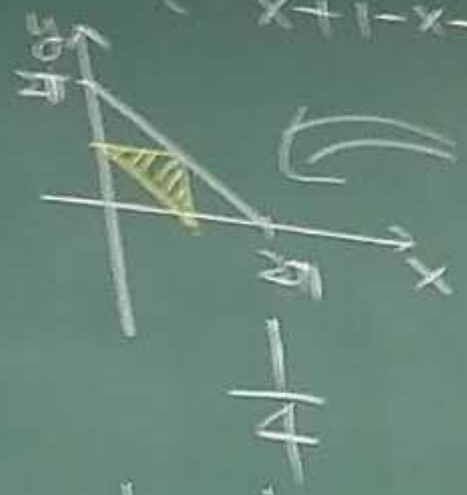
$\frac{1}{2}$ $\frac{1}{3}$ $\frac{1}{4}$



x y $1-x-y$

$$\begin{cases} 0 \le x \le 1 \\ 0 \le y \le 1 \\ 0 \le 1-x-y \le 1 \end{cases}$$

$$\begin{cases} x+y \ge 1-x-y \\ y+1-x-y > x \\ x+1-x-y > y \end{cases}$$



$$\begin{cases} 0 \le x \le \pi \\ 0 \le y \le \pi \\ 0 \le 2\pi - x - y \le \pi \end{cases}$$

2:1

$$\begin{cases} 0 \le x \le 2\pi \\ 0 \le y \le 2\pi \\ 0 \le 2\pi - x - y \le 2\pi \end{cases}$$

Pascal Fermat Correspondence.

first 6 winner.

5:3 = A:B

{AAA, BBB, ABB, BBA, ABA, BAB, AAB, BAA}.

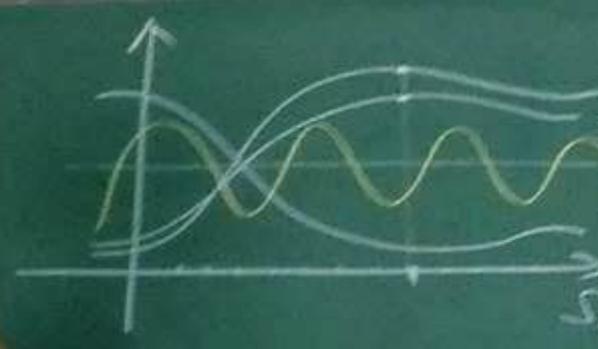
Fermat : 7:1. {BBB, A, BA, BBA}.

$$P(A|B) = \frac{P(AB)}{P(B)}$$

Multiple Random Variables. $X_1(\omega), X_2(\omega), \cdots, X_n(\omega) : \Omega \to R$

Equiprobable

$\frac{1}{2}$ $\frac{1}{3}$ $\frac{1}{4}$



$X_3 = 2a - X_2$.

$X_1, X_2, \cdots, X_n, \cdots, \Omega \to \mathbb{R}$.

Time Relations

Independence $X_1, X_2, \cdots, X_n$, i.i.d.

缺

① Correlation (Linear) ② Markov Property ③ Martingale