

Probability & Statistics.

L-1

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Subject: Prob Stat / Probability & Stat.

Mid Sem - 30

End Sem - 50

Class test - 10

70

+ 10

→ 'conduct' in the class.

$x = 4$

→ 'x' not a variable.

'Probability model' / 'Probability space'

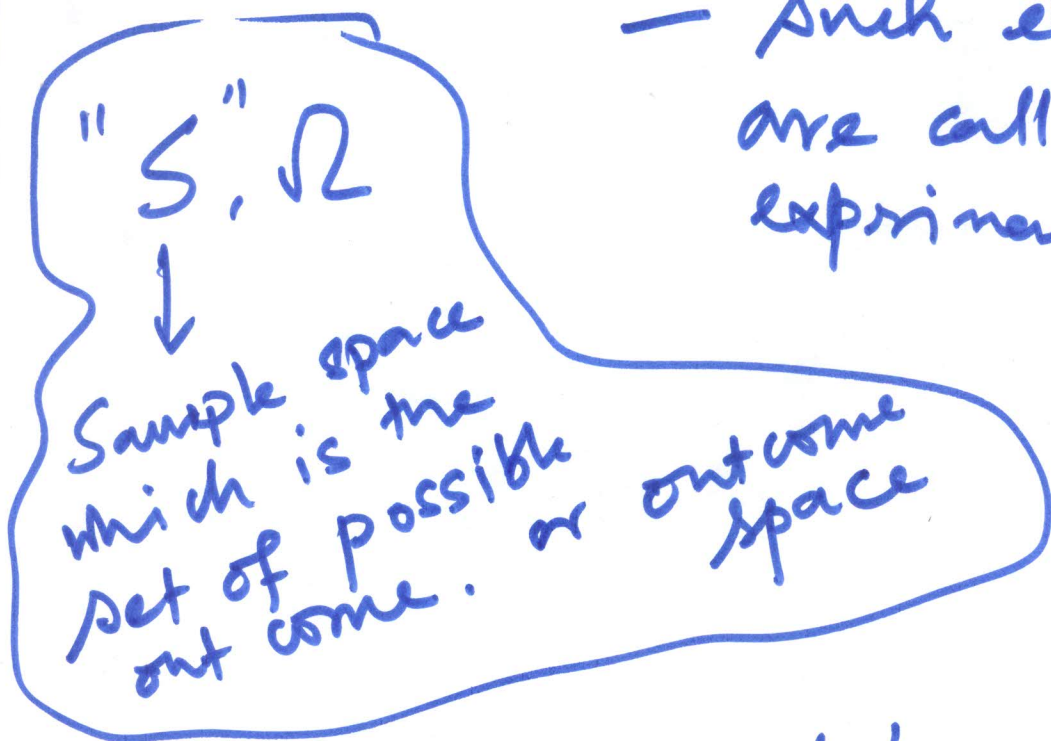
↓
Corresponding to a 'random' experiment.

— (\dot{S}, \dot{A}, P)

or (Ω, \mathcal{A}, P) .

We consider experiments for which the outcomes can not be predicted with certainly

— Such experiments are called random experiments!



Given S , let ' A ' $\subseteq S$

— then ' A ' is called an event.

$$\mathcal{A} = \mathcal{P}(S)$$

= the collection of all subsets of S .

$$\emptyset, S \in \mathcal{A}$$

When a random experiment is performed and the outcome is in ' A ' — The event ' A ' has occurred.

Terminologies.

① A_1, \dots, A_k are called 'mutually exclusive' events.

if $A_i \cap A_j = \Phi$, when $i \neq j$.

② A_1, \dots, A_k are mutually exhaustive events if

$$A_1 \cup A_2 \cup \dots \cup A_k = S.$$

'mutually exclusive & exhaustive'

Probability of an event:

Consider repeating the experiment 'n' times. Count the # of times 'A' occurs throughout these 'n' performances, called the 'frequency' of 'A' denoted by $N(A)$.

Then $\frac{N(A)}{n}$ called the 'relative frequency' of 'A'.

For small values of 'n', $\frac{N(A)}{n}$ is unstable but it tends to stabilize as 'n' increases

$$p = \lim_{n \rightarrow \infty} \frac{N(A)}{n} .$$

Exp. A disk 2 inches in diameter is thrown at 'random' on a tiled floor, where each tile is a square with sides 4 inches in length.

Let C be the event that the disk will land entirely on one tile.

$$Q. \quad P(C) = \frac{4}{16}$$