statistics

I am studying all phenomena in life then I represent these phenomena as a function but this function call it as a probability function or distribution .

Statistics and mathematics

Statistics

- X mean something.
- Function of stat. :

R ⟶ R

- In stat. I'm not certainty.

mathematics

- X don’t mean anything.
- Function of math. ;

R ⟶ [o,1]

- In math. I'm certainty.

- Sample space

The set of all possible outcomes of the experiment.

- Event

Is the elements which taking from sample space
That means:

event ≤ sample space

Some laws use it in probability

1. permutation : (arrangement)

$P^n = \frac{n!}{(n-r)!}$, r≤n

- Total permutation
- Partial permutation
- Distinct permutation

Some laws use it in probability

2. Combination : (selection or choosing)

$C^n = = \frac{n!}{r!(n-r)!}$, r≤n

- Total
- partial

Example

- In the classroom there are 20 students.

1. If I want to arrange 6 of them?
2. If I want to select 6 of them?

Solve it?

example

A box contains 3 red balls , 4 white balls, 5 blue balls , 3 balls are select:

1.If the balls are from the same color

2.If the balls are from the different color

Solve it ?

Classical probability

$$\text{Pr} = \frac{number\ of\ elements\ in\ event}{number\ of\ elements\ in\ sample\ space}$$

Axioms of probability

1- $0 \leq P(A) \leq 1$, when A is event

2- $P(S)=1$, S is sample space

Examples

- A box has 24 bulbs of which 4 are defective . Choose 4 bulbs , find the probability that they are defective.

- A set of 11 integers , 5 of them are negative and the others are positive . Choose a sample of 4 integers and multiply them , find the probability that the product is :

1- positive

2- negative