

Probability

Chapter 1 - Set theory

Chapter 2 - Counting techniques

Chapter 3 - Introduction to probability

Chapter 4 - Conditional probability and independence

Chapter 5 - Random variable

Chapter 6 - Some special discrete distribution

Chapter 7 - Some special continuous distribution

References

1. Probability theory and application (Dr. fayyadh Abdullah Ali)
2. سلسلة وملخصات شوم في الاحتمالات

1. Set and Element:

Def: A set is any well-defined list or collection of objects and will be denoted by capital letters A, B, C, ...

The object comprising the set are called its element or member and will be by lower case letter a, b, c, ...

The statement "x is an element of A" or "x belongs to A" is written $x \in A$.

There are essentially two ways to specify a particular set:

1. Listing method

If it is possible to list its elements, for example

- $A = \{1, 3, 5, 7, 9, 10, 14, 20\}$

2. Rule method

State those properties which characterize the element in the set, for example

- $D = \{x : x \text{ is an integer}, x > 20\}$

Which reads "D is the set of x such that x is an integer and x is greater than 20"

➤ We could not list all element of the set D although frequently we specify by writing.

- $D = \{20, 21, 22, 23, \dots\}$

Observe that $90 \in D$; but $-17 \notin D$, $30.5 \notin D$

- $M = \{x : x \text{ is a letter in English alphabet}, x \text{ is a vowel letter}\}$
- Let $B = \{x : x^2 - 3x + 2 = 0\}$, $F = \{2, 1\}$, $T = \{1, 2, 2, \frac{4}{2}, 1\}$ then $B = F = T$ since B can be written as $B = \{(x - 1)(x - 2) = 0\}$ so $B = \{1, 2\}$

Observe that a set does not depend on the way which the elements are displayed. A set remains the same if its elements are repeated or rearranged.

N: represent the set of positive integer number ;1,2,3,4,5,6, ...

Z: represent the set of integer number; ..., -2, -1, 0, 1, 2, ...

Q: represent the set of rational number

R: represent the set of real number