SET

Set is a collection of definite well defined objects.

Set is denoted by capital letter.

For example:

A = {a, b, c, d, e}

BINARY OPERATIONS ON A SET

Let,

G à a non-empty set

GXG = {(a ,b): a ∈ G, b ∈ G }.

Above line is read as: G cross G equal to (a, b) such that ‘a’ belongs to ‘G’, ‘b’ belongs to ‘G’.

If

f : GXG = G,

Above line is read as ‘f’ is such that G cross G is equal to G.

Here ‘f’ is an operation of ‘X’ on two groups ‘G’ and ‘G’.

The output of ‘GXG’ is also a ‘ G ‘ so this type of operation is known as Binary Operation on a set G.

And,

Operation ‘f’ on ‘G’ and ‘G’ can be denoted as ‘GfG’ , or ‘afb’ where (a ∈ G, b ∈ G).

+, x, etc symbols are used in Binary Operations.

Binary Operations examples:-

1) $a + b \in G, \forall a, b \in G$.

Above line is read as ‘a’ plus ‘b’ belongs to ‘G’, for all ‘a’, ‘b’ belongs to ‘G’.

Here, ∀ à for all.

2) $a * b = G, \forall a,b \in G$.

3) Addition of natural numbers is also a natural number.

Natural number are also known as all non-negative or positive numbers (0,1,2,3,4……).

If, N à Set of natural numbers

$A + b \in N, \forall a, b \in N$.

Above line is read as ‘a’ plus ‘b’ belongs to ‘N’, for all ‘a’, ‘b’ ∈‘N’.

4) Subtraction is not binary operation on N (natural numbers).

Nà Set of natural numbers.

$3 – 5 = – 2 \notin N$, whereas $3, 5 \in N$.

Above line is read as three minus five is not belongs to ‘N’, whereas three, five belongs to ‘N’.

5) Subtraction is binary operation on I (integer numbers).

I –> Set of integer numbers

$3 - 5 = -2 \in I, \ \forall a, b \in I.$

Related posts:

1. SET
2. Mathematical induction
3. Relation
4. Net 34
5. prove that- AX(B∩C) = (AXB) ∩ (AXC)
6. Prove that- A∩(B∪C) = (A∩B) ∪ (A∩C)
7. prove that – (A∩B)X(C∩D) = (AXC)∩(BXD)
8. Show that- (P∩Q)X(R∩S) = (PXR)∩(QXS)
9. Algebraic structure
10. Group
11. Show that (…, -4, -3, -2, -1, 0, 1, 2, 3, 4,…} is group
12. Show that a*b=b*a
13. if a*c = c*a and b*c = c*b, then (a*b)*c = c*(a*b)
14. Undirected Graph and Incident Matrix
15. Prove the following by using the principle of mathematical induction for all $n \in N$, $1^3 + 2^3 + 3^3 + \dots + n^3 = [n (n + 1)/2]^2$
16. Prove that G={−1,1,i,−i} is a group under multiplication.
17. Hasse diagram for the “less than or equal to” relation on the set S= { 0,1,2,3,4,5}