CLASS 11 MATHS REVISION NOTES

Class 11 Maths Chapter 1 Sets – Quick Revision Notes

Quick last-minute revision bullets covering every definition, notation, and formula in Chapter 1 -- Sets.

Contents

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Basic Definitions

Set: a well-defined collection of distinct objects.

Element/Member: $x \in A$ (belongs), $x \notin A$ (does not belong).

Roster form: elements listed within braces, e.g. {1,2,3}.

Set-builder form: a rule describing elements, e.g. {x : x is a natural number less than 4}.

Types of Sets

Empty/Null set (φ): no elements; $n(\varphi)=0$.

Singleton set: exactly one element.

Finite / Infinite sets.

Equal sets: $A=B$ if every element of each is in the other.

Equivalent sets: same number of elements (need not be identical).

Universal set (U): the overall set for a given context.

Subsets and Power Set

Subset: $A \subset B$ if every element of A is in B.

Proper subset: $A \subset B$ and $A \neq B$.

Empty set is a subset of every set; every set is a subset of itself.

Power set P(A): set of all subsets of A.

Number of subsets of an n-element set = $\mathbf{2^n}$; proper subsets = 2^n-1.

If $A \subset B$, then $P(A) \subset P(B)$.

Intervals as Subsets of R

Open $(a,b) = \{x: a<x<b\}$.

Closed $[a,b] = \{x: a \leq x \leq b\}$.

Semi-open/closed [a,b) or (a,b].

Operations on Sets

Union (A∪B): {x: x∈A or x∈B}.

Intersection (A∩B): {x: x∈A and x∈B}.

Disjoint sets: A∩B=φ.

Difference (A-B): {x: x∈A and x∉B} = A∩B′.

Complement (A'): U-A.

Key Laws and Identities

Commutative: A∪B=B∪A; A∩B=B∩A.

Associative: (A∪B)∪C=A∪(B∪C); (A∩B)∩C=A∩(B∩C).

Distributive: A∪(B∩C)=(A∪B)∩(A∪C); A∩(B∪C)=(A∩B)∪(A∩C).

Identity: A∪φ=A; A∩U=A; A∪U=U; A∩φ=φ.

Complement: A∪A′=U; A∩A′=φ; (A′)′=A; U′=φ; φ′=U.

De Morgan's Laws: (A∪B)′=A′∩B′; (A∩B)′=A′∪B′.

A=(A∩B)∪(A-B); A∪B=A∪(B-A).

If A⊂B: A-B=φ, A∪B=B, A∩B=A.

Cardinal Number Formulas

n(A∪B) = n(A)+n(B)-n(A∩B) (two sets); disjoint ⇒ n(A∪B)=n(A)+n(B).

n(A-B)=n(A)-n(A∩B).

n(A∪B∪C) = n(A)+n(B)+n(C)-n(A∩B)-n(B∩C)-n(A∩C)+n(A∩B∩C) (three sets).

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