

Sets

CBSE Class 11 Maths · Knowledge organiser

KEY DEFINITIONS

Set

A well-defined collection of objects, called its elements.

Subset

$A \subset B$ when every element of A is also in B .

Complement

A' : the elements of the universal set that are not in A .

KEY FORMULAS

Intervals: (a, b) , $[a, b]$, $[a, b)$, $(a, b]$; $A \subset B$: every element of A is in B

Difference; complement	$A - B = A \cap B'$; $A \cup A' = U$, $A \cap A' = \phi$
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De Morgan	$(A \cup B)' = A' \cap B'$, $(A \cap B)' = A' \cup B'$
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Distributive	$A \cap (B \cup C) = (A \cap B) \cup (A \cap C)$
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YOU SHOULD BE ABLE TO...

- Switch between roster and set-builder forms, spot empty and equal sets, and use interval notation.
- Find unions, intersections, differences and complements, including of intervals, and verify De Morgan's laws.
- Prove set identities by elements and answer multi-part Venn-diagram questions.
- Reason with subsets and the distributive laws and handle tricky interval end-points.

WORKED EXAMPLE

Write $\{x : x \in \mathbb{Z}, x^2 < 10\}$ in roster form.

$x^2 < 10$ for $x = -3, -2, \dots, 3$: $\{-3, -2, -1, 0, 1, 2, 3\}$.

COMMON MISTAKES

- ✗ Repeating elements in roster form, or treating $\{\phi\}$ as empty (it has one element).
- ✗ Getting the end-points of intervals wrong in intersections and differences.
- ✗ Writing $(A \cup B)' = A' \cup B'$: De Morgan's laws swap union and intersection.
- ✗ Confusing $\in$ (element) with $\subset$ (subset).