Grade 9 – CBSE Mathematics

Mind Map

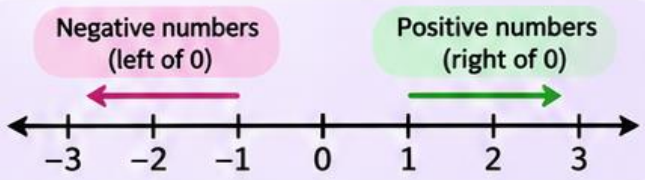
The World of Numbers

1. Number Families

- **Natural Numbers:** 1, 2, 3, ...
- **Whole Numbers:** 0, 1, 2, 3, ...
- **Integers:** ..., −2, −1, 0, 1, 2, ...
- **Rational Numbers:** $\frac{p}{q}$, $q \neq 0$
- **Irrational Numbers:** $\sqrt{2}$, $\sqrt{3}$, π
- **Real Numbers:** all rational and irrational numbers

2. Representation on Number Line

- Positive numbers lie to the right of 0
- Negative numbers lie to the left of 0
- Every real number can be shown on the number line



3. Decimal Expansions

- Rational numbers have terminating or recurring decimals.
- Irrational numbers have non-terminating, non-recurring decimals.

Examples:

$\frac{1}{4} = 0.25$ | $\frac{2}{3} = 0.666...$ | $\sqrt{2} = 1.414...$

4. Properties / Laws

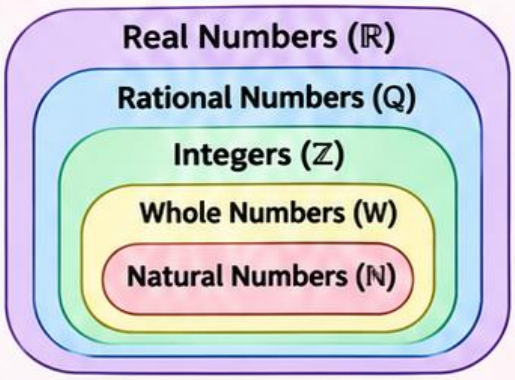
- Closure
- Commutative property
- Associative property
- Distributive property
- Identity elements

Properties vary for different number sets.

5. Important Concepts

- **Prime and Composite Numbers**
  e.g. 7 is prime; 8 is composite.
- **Factors and Multiples**
  e.g. Factors of 12: 1, 2, 3, 4, 6, 12
- **HCF and LCM**
  e.g. HCF(12, 18) = 6, LCM(12, 18) = 36
- **Even and Odd Numbers**
  e.g. 14 is even; 15 is odd.

6. Visual Classification



- Natural ⊂ Whole ⊂ Integers ⊂ Rational ⊂ Real
- Irrational numbers also belong to Real Numbers.

Key Takeaways

- Numbers are used to count, compare, measure, and solve problems.
- Real numbers include rational and irrational numbers.
- Decimal form helps identify the type of number.
- Number line helps visualize and compare values.

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