1. What Are Numbers?

Numbers are symbols or figures that are used to **count, measure, label, or compare quantities**. They are a basic part of mathematics and are used in everyday life, such as counting objects, keeping track of money, telling time, measuring distances, and much more. Without numbers, it would be impossible to perform even simple calculations.

Example:

- If you have 3 apples and your friend gives you 2 more, you can count them using numbers: 3 + 2 = 5 apples.

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2. Basic Properties of Numbers

a) Even and Odd Numbers

- **Even numbers** are those which can be **divided exactly by 2**.
  Examples: 2, 4, 6, 8, 10

- **Odd numbers** are those which **cannot be divided exactly by 2**.
  Examples: 1, 3, 5, 7, 9

Example:

- 14 ÷ 2 = 7 ▢ Even

- 15 ÷ 2 = 7 remainder 1 ▢ Odd

Tip: If a number ends in 0, 2, 4, 6, or 8, it is even; otherwise, it is odd.

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b) Prime and Composite Numbers

- **Prime numbers** are numbers greater than 1 that **have only two factors**, 1 and the number itself.
  Examples: 2, 3, 5, 7, 11

- **Composite numbers** are numbers that **have more than two factors**, meaning they can be divided by numbers other than 1 and themselves.
  Examples: 4, 6, 8, 9, 12

- **Note:** 1 is **neither prime nor composite** because it has only one factor.

Example:

- Factors of 9 = 1, 3, 9 ⬚ Composite

- Factors of 7 = 1, 7 ⬚ Prime

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c) Factors and Multiples

- **Factors** are numbers that **divide another number exactly** without leaving a remainder.
  Example: Factors of 12 = 1, 2, 3, 4, 6, 12

- **Multiples** are numbers obtained by multiplying a given number by natural numbers.
  Example: Multiples of 5 = 5, 10, 15, 20, 25

Tip: Every number is a factor of itself, and 1 is a factor of every number.

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3. Types of Numbers

Type	Description	Examples
Natural numbers	Counting numbers starting from 1	1, 2, 3, 4, 5
Whole numbers	Natural numbers including zero	0, 1, 2, 3, 4
Integers	All positive and negative numbers including zero	-3, -2, -1, 0, 1, 2, 3
Rational numbers	Numbers that can be written as fractions (p/q) where q ≠ 0	1/2, 3/4, -2, 0.25
Irrational numbers	Numbers that cannot be expressed as fractions; their decimals go on forever without repeating	$\sqrt{2}$, π, 0.1010010001...

Example:

- -5 ⬚ Integer ⬚ ⟋Whole ⬚ ⟋Natural ⬚

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4. Number Line

A **number line** is a straight line on which numbers are marked at equal intervals.

- Numbers **increase** as you move to the **right**.

- Numbers **decrease** as you move to the **left**.

- The number line helps us **visualize integers**, compare numbers, and perform basic operations.

Example:

- On a number line, -2 lies to the right of -5, so -2 > -5.

5. Operations with Integers

a) Addition of Integers

- **Same signs:** Add the numbers and keep the common sign.
  Example: (-4) + (-3) = -7

- **Different signs:** Subtract the smaller number from the larger one and keep the sign of the larger number.
  Example: 7 + (-3) = 4

b) Subtraction of Integers

- Subtraction can be changed into **addition of the opposite**.
  Example: 6 − (-2) = 6 + 2 = 8

c) Multiplication of Integers

- **Same signs:** The result is positive
  Example: (-5) × (-4) = 20

- **Different signs:** The result is negative
  Example: (-5) × 4 = -20

d) Division of Integers

- **Same signs:** The quotient is positive
  Example: 20 ÷ 4 = 5, (-20) ÷ (-4) = 5

- **Different signs:** The quotient is negative
  Example: (-20) ÷ 5 = -4

Important Rules to Remember:

1.
   Zero is neither positive nor negative.

2.
   Division by zero is **not defined**.

3.
   Every natural number is a whole number, but not every whole number is a natural number.