

Number System and Simplification



Numbers:-

There are two types of Numbers :-

1. Natural numbers
2. Whole numbers

1. Natural Numbers:- Counting numbers are called natural numbers.

For example:- 1,2,3,4,5,6..., etc., are all natural numbers.

2. Whole Numbers:- All natural numbers together with 0 (zero) are called whole numbers.

For example:- 0,1,2,3,4 etc. are whole numbers.

➤ Predecessor and Successor:-

(i) **Predecessor:** Predecessor is 1 less than the given number.

For example: Predecessor of 59019 is 59018.

(ii) **Successor:** Successor is 1 more than the given number.

Successor of 9456 is 9457 .

➤ Comparison of Numbers

- Greater number has a greater number of digits.
- To compare two numbers having same number of digits, start comparing from the left most position. If the leftmost digits are equal, move to the next digit.

Example: Find the largest and smallest number from the following group of numbers:

23715, 6834, 24512, 2420

Sol: Largest number: 24512

Smallest number: 2420

➤ Face value and Place Value

Face value:- Face value of a digit in a numeral is the value of the digit itself at whatever place it may be.

Place value:- Place value of a digit = Face value of a digit $\times$ value of the place

Number	Digit	Face Value	Place Value
13,456	1	1	10,000
	3	3	3,000
	4	4	400
	5	5	50
	6	6	6

➤ Expanded form of numbers

If we express a given number as the sum of its place value, it is called its expanded form.

For example: The expanded form of 2,54,027 is

$$2 \times 100000 + 5 \times 10000 + 4 \times 1000 + 0 \times 100 + 2 \times 10 + 7 \times 1$$

➤ Indian & International System of Numeration

(a) Indian System of Numbers

Ten Crore	One Crore	Ten Lakh	One Lakh	Ten Thousand	One Thousand	One Hundred	Tens	Ones
10,00,00,000	1,00,00,000	10,00,000	1,00,000	10,000	1,000	100	10	1
9 Digits	8 Digits	7 Digits	6 Digits	5 Digits	4 Digits	3 Digits	2 Digits	1 Digit

(b) International System of Numbers

Billions			Millions		
Hundred Billions	Ten Billions	One Billion	Hundred Millions	Ten Millions	One Million
100, 000, 000, 000	10, 000, 000, 000	1, 000, 000, 000	100, 000, 000	10, 000, 000	1, 000, 000
12 Digits	11 Digits	10 Digits	9 Digits	8 Digits	7 Digits

Thousands			One Hundred	Tens	Ones
Hundred Thousand	Ten Thousand	One Thousand			
100, 000	10,000	1000	100	10	1 Digit
6 Digits	5 Digits	4 Digits	3 Digits	2 Digits	

(i) 480431 = 4,80,431 = Four lakh Eighty thousand four hundred thirty one.

(ii) 698985102 = 698,985,102 = six hundred ninety-eight million nine hundred eighty-five thousand one hundred two.

Simplification

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Example: Simplify: $(-10) + (-8) \div (-4) \times 3$

Sol: We have, $(-10) + (-8) \div (-4) \times 3 = (-10) + 2 \times 3 = (-10) + 6 = -4$

Unitary method

In simple words: first find the value of a unit, then multiply and find the value of many units. Suppose you bought 2 chocolates for 50 rupees. How much will 4 chocolates cost?

Let's solve it with the unitary method.

Sol:

Price of 2 chocolates = ₹50

Step 1: Find the price of 1 chocolate (one unit)

Price of 1 chocolate = ₹50 ÷ 2 = ₹25

Step 2: Price of 4 chocolates = ₹25 × 4 = ₹100