

(ITHO)

Number Sense and Numerations

Numbers

Numbers are mathematical symbol by which we express date, time, distance, position, quantity etc.
We use ten symbols (0, 1, 2, 3, 4, 5, 6, 7, 8, 9) to write any number.
Like 62232, 52155, 40034 etc.

Number System

Number system deals with the study of different types of numbers. In this chapter, we will study about the categorization of different types of numbers.

Natural Numbers

Counting starts with 1 and continue till infinite. Counting numbers are called natural numbers.
For example, 1, 2, 3, 4, 5, 6, 7 etc.

Whole Numbers

When 0 is included with natural numbers, they are called whole number. In other words "Natural numbers together with zero are called whole numbers."
For example, 0, 1, 2, 3, 4, 5, 6, 7 etc.

Integers

Integers are the collection of whole numbers and negative of natural numbers.
For example,

-5, -4, -3, -2, -1, 0, + 1, + 2, + 3, + 4, + 5, + 6, + 7 etc.

System of Numeration

Mathematical notation of numbers is called numeration. Let us know about two types of numeration.

(A) Indian system of numeration

(B) International system of numeration

Indian System of Numeration

It is a positional decimal number system. Look at the following place value chart

Period	Kharab		Arab		Crores		Lakhs		Thousands		ones	
Places	Ten Kharab (T-kh) 100000000000	Kharab (kh) 10000000000	Ten Arab (T-A) 1000000000	Arab (A) 100000000	Ten Crores (T-C) 10000000	Crores (C) 1000000	Ten Lakhs (T-L) 100000	Lakhs (L) 10000	Ten thousands (T-TH) 1000	Thousands (TH) 100	Hundreds (TH) 10	Ones (O) 0

International System of Numeration This system is applied in whole world. The following place value chart shows the international system of numeration.

Period	Trillions	Billions	Millions	Thousands	Ones
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Places	Hundred Trillions (100000000000000) Ten Trillions (10000000000000) Trillions (1000000000000)	Hundred billions (100000000000) Ten billions (10000000000) Billions (1000000000)	Hundred millions (100000000) Ten millions (10000000) Millions (1000000)	Hundred thousands (100000) Ten thousands (10000) Thousands (1000)	Hundred (100) Tens (10) Ones (0)
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Place Value

Place value of a digit in a number is the position it occupies according to the place value chart.

➤ **Example:**

Find the place value of 5 in the number 568232.

Solution: 500000

Face value

Face value of a number is the number itself.

➤ **Example:**

Find the face value of 3 in the number 453282.

Solution: 3

Successor

The number which comes just after a number is called successor of that number.

➤ **Example:**

Find the successor of 4444.

Solution: $4444 + 1 = 4445$

Predecessor

Predecessor of a number just comes before the number.

➤ **Example:**

Find the predecessor of 4444.

Solution: $4444 - 1 = 4443$

Roman Numeral

Roman numerals represent the numbers using alphabetical symbols.

The seven alphabetical symbol, which are used in Roman system of numeration, and their values are as follows:

Symbols	Value
I	1
V	5
X	10
L	50
C	100
D	500
M	1000

Rules for Using Symbols

Rule1: When a symbol is repeated, its value is multiplied as many times as the symbol is repeated.

➤ **Example:**

$$II = 2 \times 1 = 2$$

$$XXX = 3 \times 10 = 30$$

$$MM = 2 \times 1000 = 2000$$

Therefore, the above expression is not correct.

$$DC = 500 + 100 = 600$$
$$CD = 500 - 100 = 400$$
$$DXC = 500 + 100 - 10 = 590$$
[illegible]

Note: A symbol can not be repeated more than 3 times.