

CURRICULUM(class-X)- Mathematics

UNITS	UNIT NAME	MARKS
I	NUMBER SYSTEM	6
II	ALGEBRA	20
III	COORDINATE GEOMETRY	06
IV	GEOMETRY	15
V	TRIGONOMETRY	12
VI	MENSURATION	10
VII	STATISTICS	11
	TOTAL	80



CHAPTER-1

Real Numbers

UNIT: NUMBER SYSTEM

WEIGHTAGE-6 MARKS

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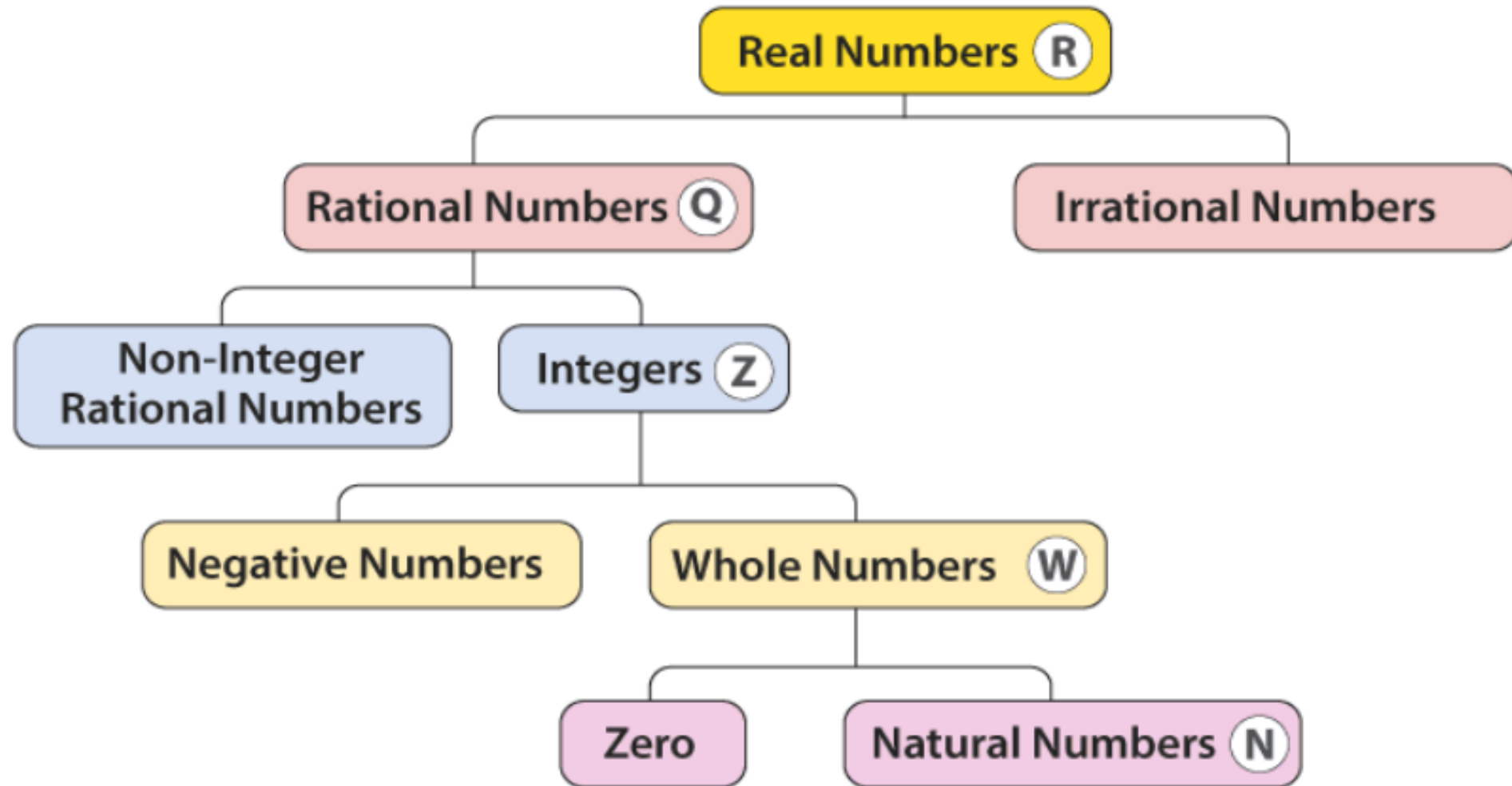
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Set of Real Numbers

The set of real numbers consist of different categories, such as natural and whole numbers, rational and irrational numbers and integers. In the table given here, all these numbers are defined with examples.

Category	Definition	Example
Natural Numbers	Contain all counting numbers which start from 1. $N = \{1, 2, 3, 4, \dots\}$	All numbers such as 1, 2, 3, 4, 5, 6,
Whole Numbers	Collection of zero and natural number. $W = \{0, 1, 2, 3, \dots\}$	All numbers including 0 such as 0, 1, 2, 3, 4, 5, 6,
Integers	The collective result of whole numbers and negative of all natural numbers.	Includes: -infinity ($-\infty$), -4, -3, -2, -1, 0, 1, 2, 3, 4, +infinity ($+\infty$)
Rational Numbers	Numbers that can be written in the form of p/q , where $q \neq 0$.	Examples of rational numbers are $\frac{1}{2}$, $\frac{5}{4}$ and $\frac{12}{6}$ etc.
Irrational Numbers	All the numbers which are not rational and cannot be written in the form of p/q .	Irrational numbers are non-terminating and non-repeating in nature like $\sqrt{2}$

REAL NUMBERS CHART



Notes

- ▶ **A lemma** is a proven statement used for proving another statement.
- ▶ Euclid's Division Lemma :
- ▶ first recorded in Book VII of Euclid's Elements. Euclid's division algorithm is based on this lemma.

For given positive integers a and b , there exist unique integers q and r satisfying

$$a = bq + r, 0 \leq r < b.$$

Continued..

▶ An algorithm is a series of well defined steps which gives a procedure for solving a type of problem.

▶ **Euclid's division algorithm:**

A technique to compute HCF(Highest Common Factor) using Euclid's division Lemma

Euclid's division Algorithm

- ▶ To obtain the HCF of two positive integers, say a and b , with $a > b$, follow the steps below:
- ▶ Step 1 : Apply Euclid's division lemma, to a and b . So, we find whole numbers, q and
- ▶ Step 2 : If $r = 0$, b is the HCF of a and b . If $r \neq 0$, apply the division lemma to b and r .
- ▶ Step 3 : Continue the process till the remainder is zero. The divisor at this stage will be the required HCF.

Example

- To find the HCF of the integers 455 and 42.

We start with the larger integer, that is, 455.

Then we use Euclid's lemma to get

$$455 = 42 \times 10 + 35$$

Now consider the divisor 42 and the remainder 35, and apply the division lemma

$$42 = 35 \times 1 + 7$$

Now consider the divisor 35 and the remainder 7, and apply the division lemma to get

$$35 = 7 \times 5 + 0$$

Notice that the remainder has become zero, and we cannot proceed any further.

So, we claim that the HCF of 455 and 42 is the divisor at this stage, i.e., **7**.

To be continued..