NUMBER SYSTEM

The mysterious world of numbers...

NATURAL NUMBER

प्राकृतिक संख्या

$$N = \{1, 2, 3, 4, ...\}$$

WHOLE NUMBER
पूर्ण संख्या

Numbers from 0 (zero)
onward are known
as Whole numbers,
denoted by 'W'

$$W = \{0, 1, 2, 3, 4, \ldots\}$$

INTEGER
पूर्णांक संख्या

The collection of all whole numbers and negative of natural numbers are called Integers, Denoted by 'Z' or 'I'.

Z or I = {...... −3, −2, −1,0,1,2,3 ......}

RATIONAL NUMBER
परिमेय संख्या

A number which can be expressed as where q ≠ 0 and q εZ is know as rational number, denoted by 'Q'.
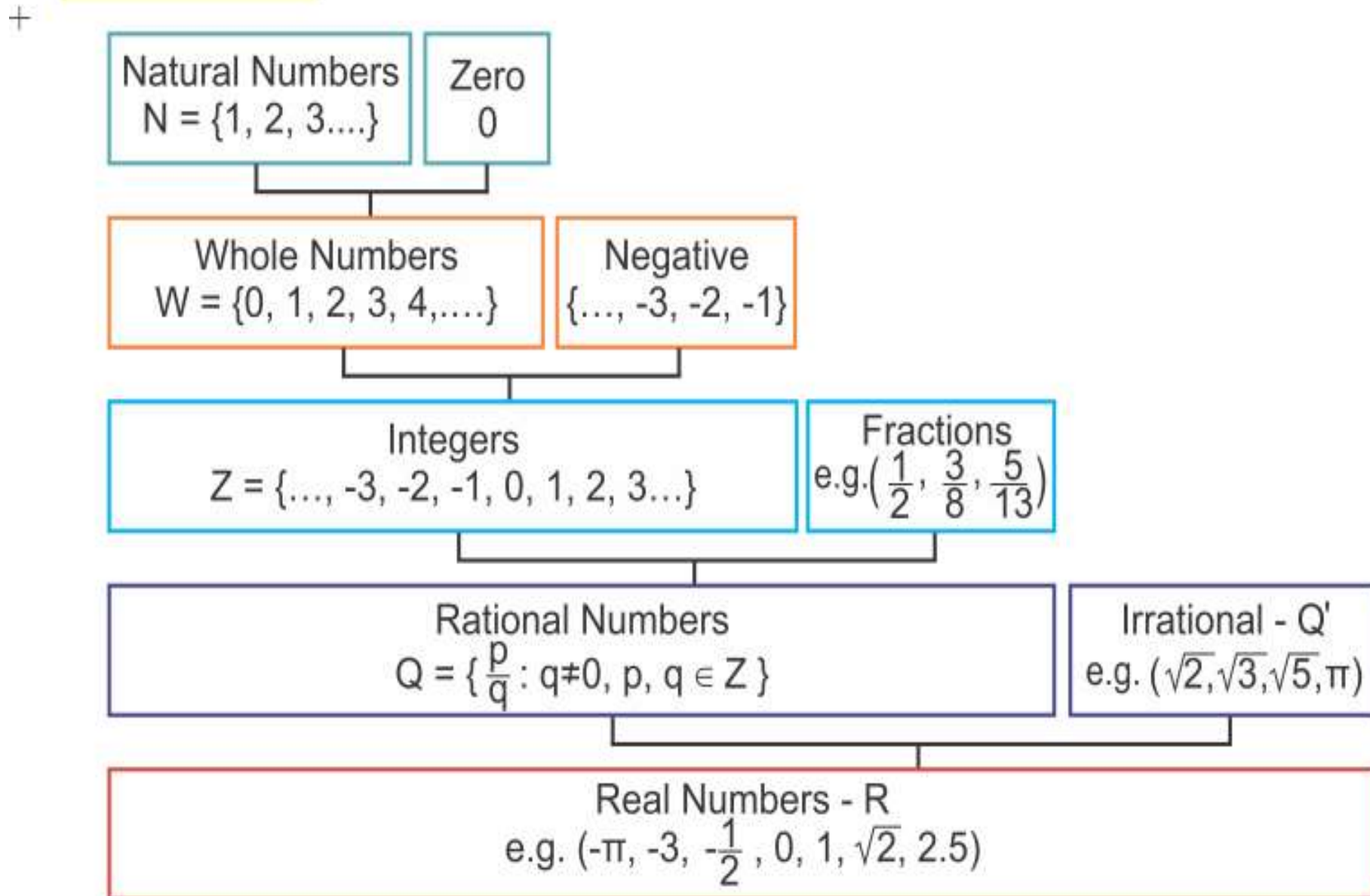
IRRATIONAL NUMBER
अपरिमेय संख्या

A number which can't be expressed in the form of p/q and its decimal representation is non-terminating and non-repeating is known as irrational number.

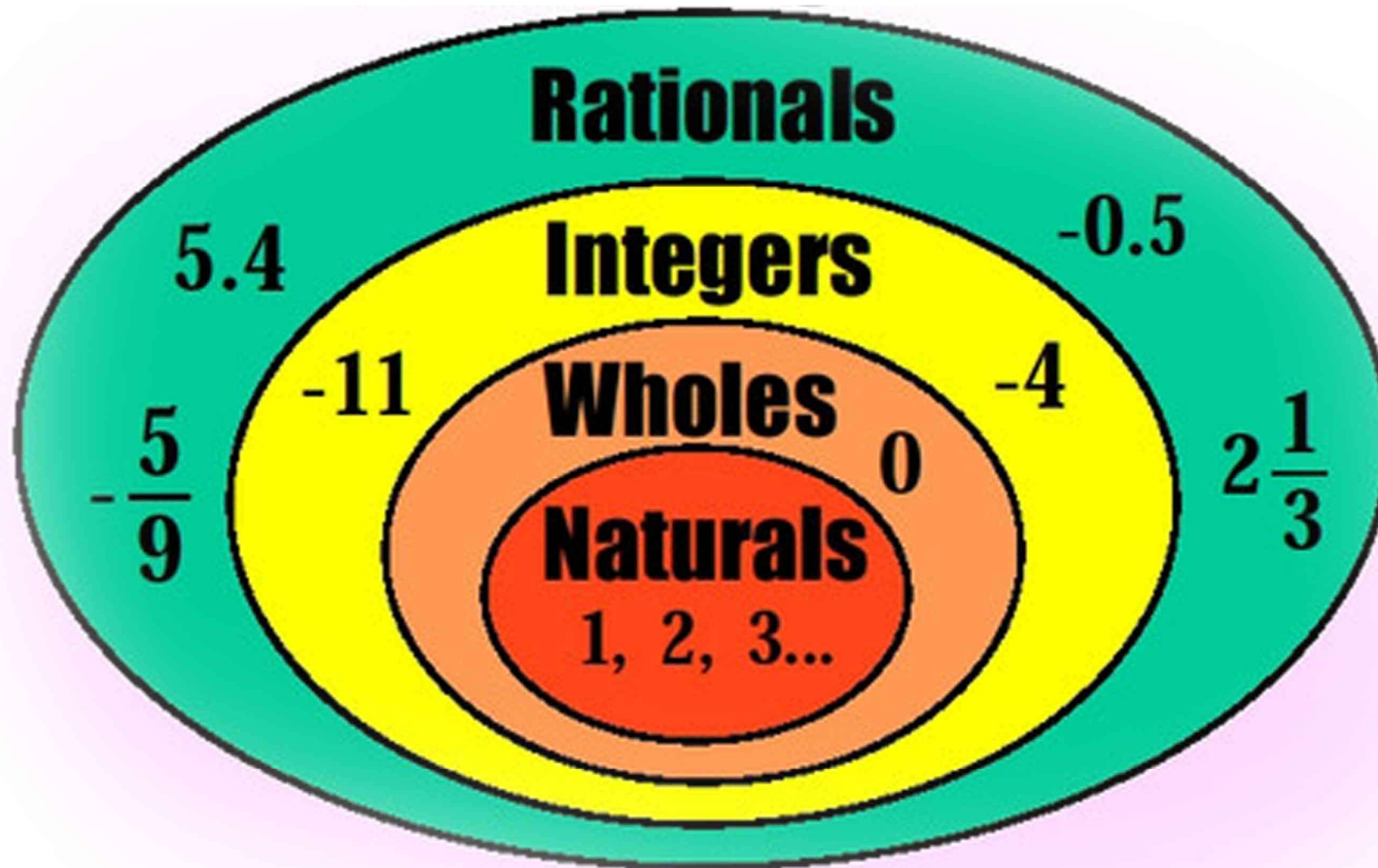The numbers which are not rational numbers, are called irrational numbers.
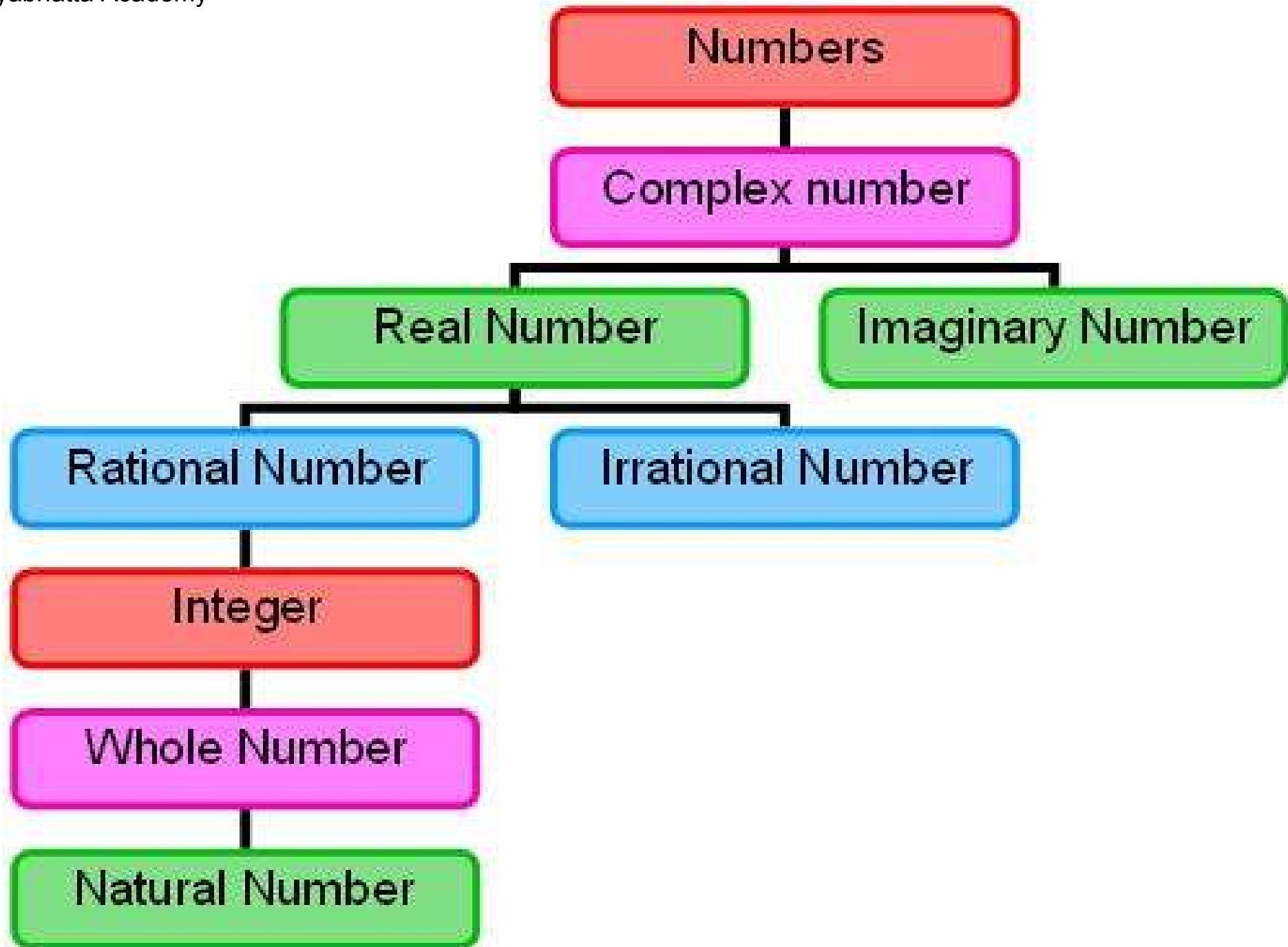
REAL NUMBER
वास्तविक संख्या

Real numbers can be defined as the union of both the rational and irrational numbers. They can be both positive or negative and are denoted by the symbol "R". All the natural numbers, decimals, and fractions come under this category..

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The Number System

Natural Numbers
N = {1, 2, 3....}

Zero
0

Whole Numbers
W = {0, 1, 2, 3, 4,....}

Negative
{..., -3, -2, -1}

Integers
Z = {..., -3, -2, -1, 0, 1, 2, 3...}

Fractions
e.g. $\left(\frac{1}{2}, \frac{3}{8}, \frac{5}{13}\right)$

Rational Numbers
$Q = \{\frac{p}{q} : q \neq 0, p, q \in Z\}$

Irrational - Q'
e.g. $(\sqrt{2}, \sqrt{3}, \sqrt{5}, \pi)$

Real Numbers - R
e.g. $(-\pi, -3, -\frac{1}{2}, 0, 1, \sqrt{2}, 2.5)$

IG-02/94

N3

Number System

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```
                    ┌─────────────────┐
                    │     Numbers     │
                    └────────┬────────┘
                    ┌────────┴────────┐
                    │ Complex number  │
                    └────────┬────────┘
            ┌────────────────┴──────────────────┐
    ┌───────┴────────┐                  ┌────────┴─────────┐
    │  Real Number   │                  │ Imaginary Number │
    └───────┬────────┘                  └──────────────────┘
    ┌───────┴────────────────┐
┌───┴────────────┐  ┌────────┴────────┐
│ Rational Number│  │Irrational Number│
└───────┬────────┘  └─────────────────┘
┌───────┴────────┐
│    Integer     │
└───────┬────────┘
┌───────┴────────┐
│  Whole Number  │
└───────┬────────┘
┌───────┴────────┐
│ Natural Number │
└────────────────┘
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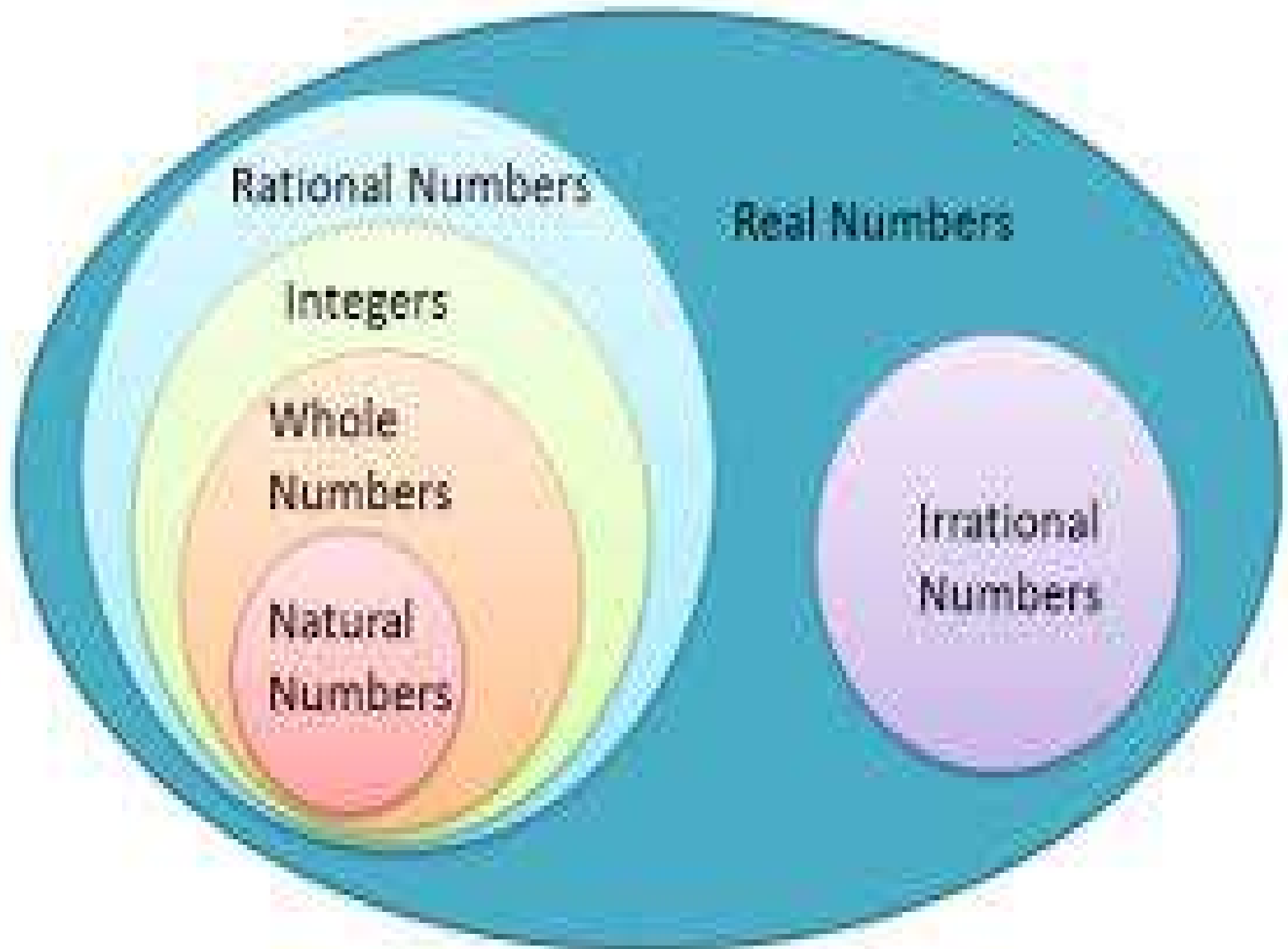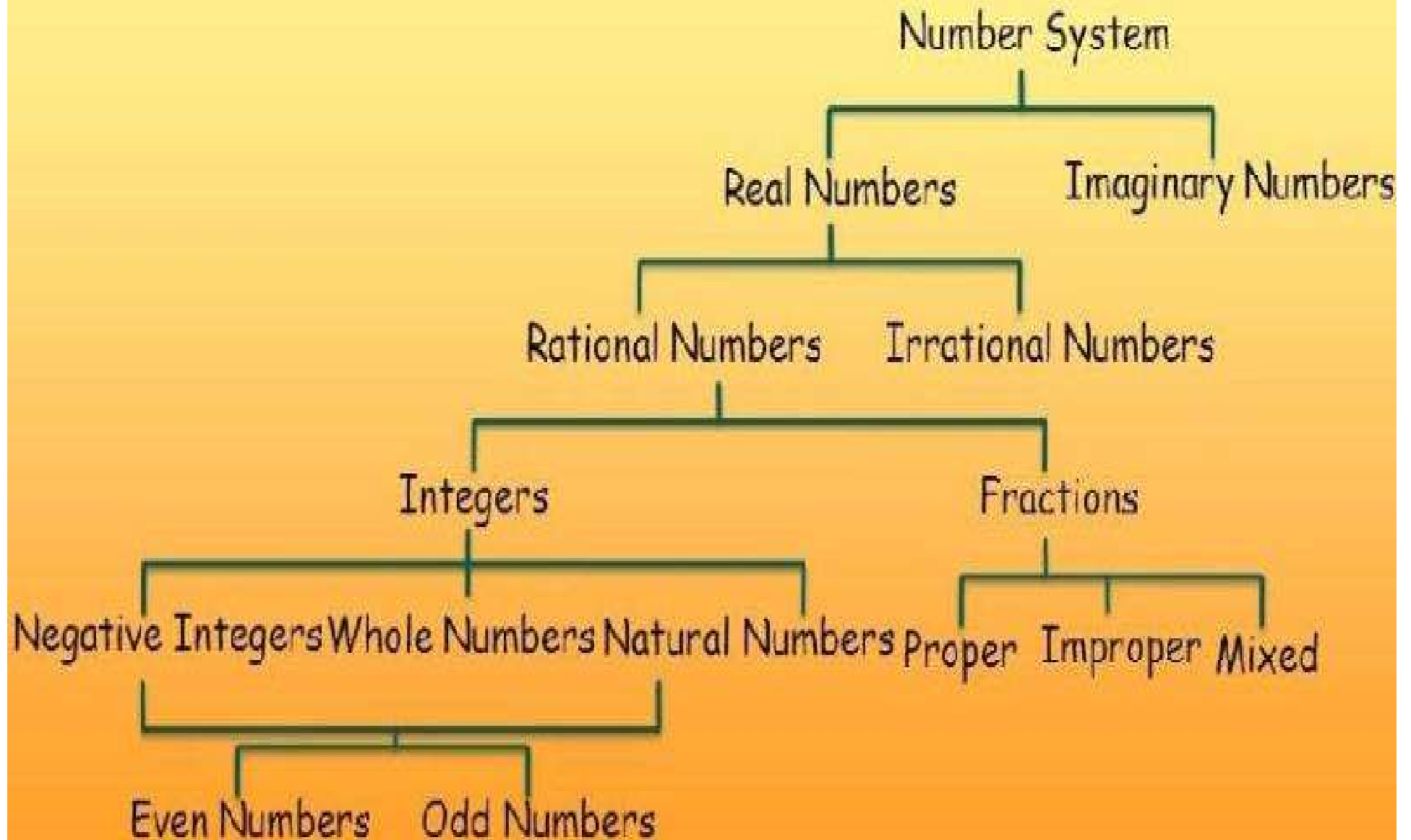

Classification of Numbers
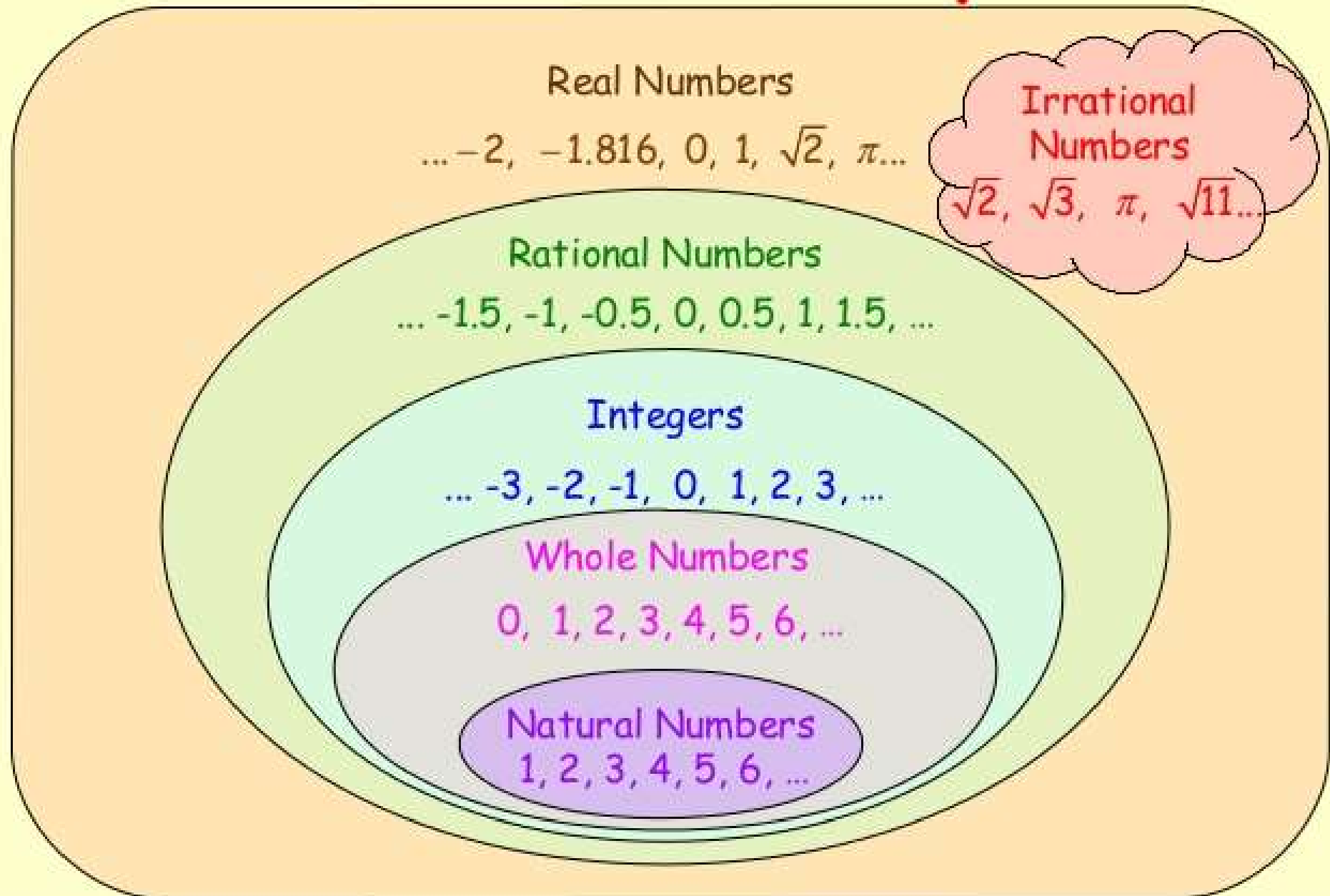
Number System & Simplification PDF

The Real Number System

Real Numbers

Rational Numbers: Can be expressed as a ratio of two integers.

Integers: (...,-2,-1,0,1,2,...)

Whole Numbers: {0,1,2,3,...}

Natural Numbers: {1,2,3,...}

Irrational Numbers: Cannot be Expressed as a ratio of two integers.

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The Real Number System

Real Numbers

$\dots -2, \ -1.816, \ 0, \ 1, \ \sqrt{2}, \ \pi \dots$

Irrational Numbers

$\sqrt{2}, \ \sqrt{3}, \ \pi, \ \sqrt{11} \dots$

Rational Numbers

$\dots -1.5, -1, -0.5, 0, 0.5, 1, 1.5, \dots$

Integers

$\dots -3, -2, -1, \ 0, \ 1, 2, 3, \dots$

Whole Numbers

$0, 1, 2, 3, 4, 5, 6, \dots$

Natural Numbers

$1, 2, 3, 4, 5, 6, \dots$

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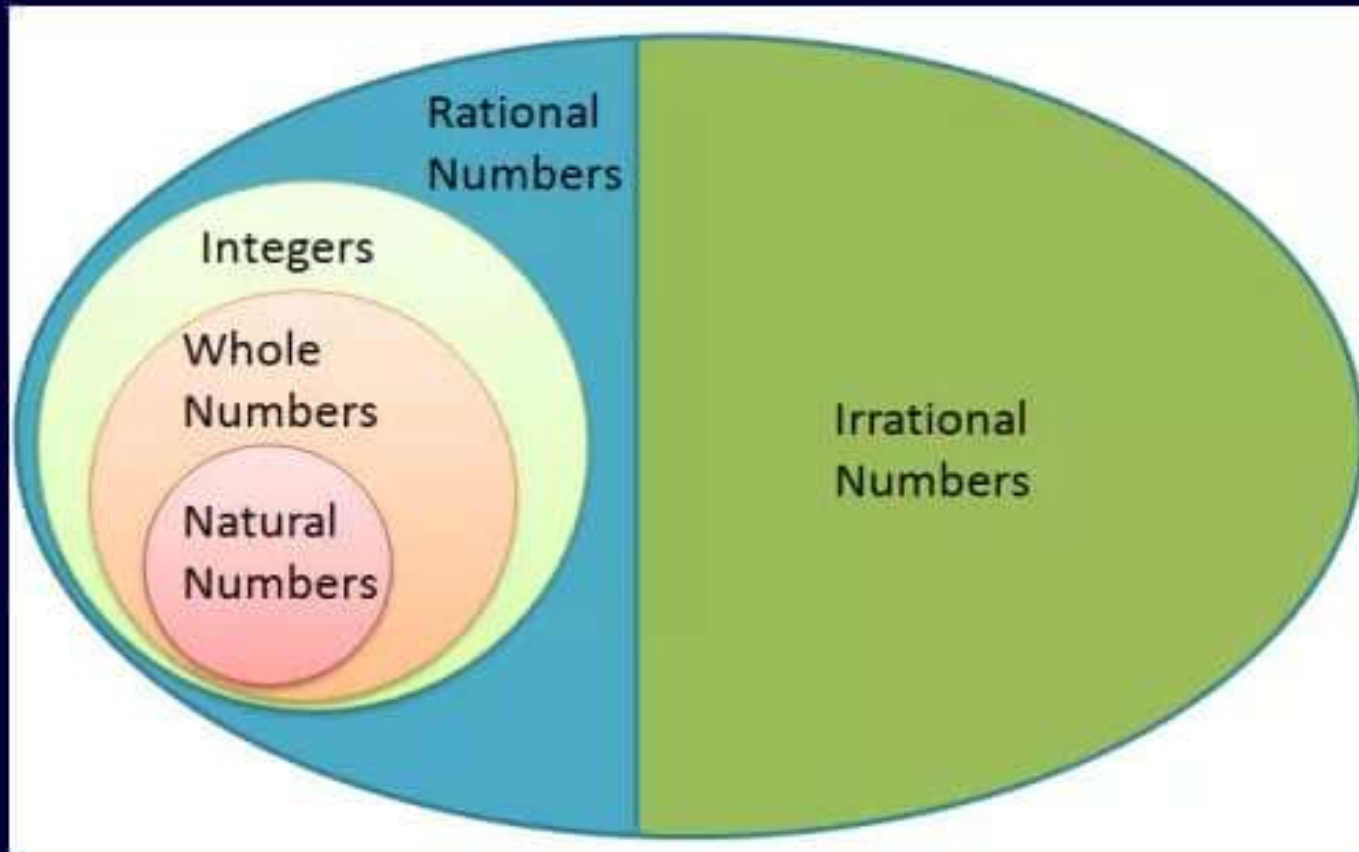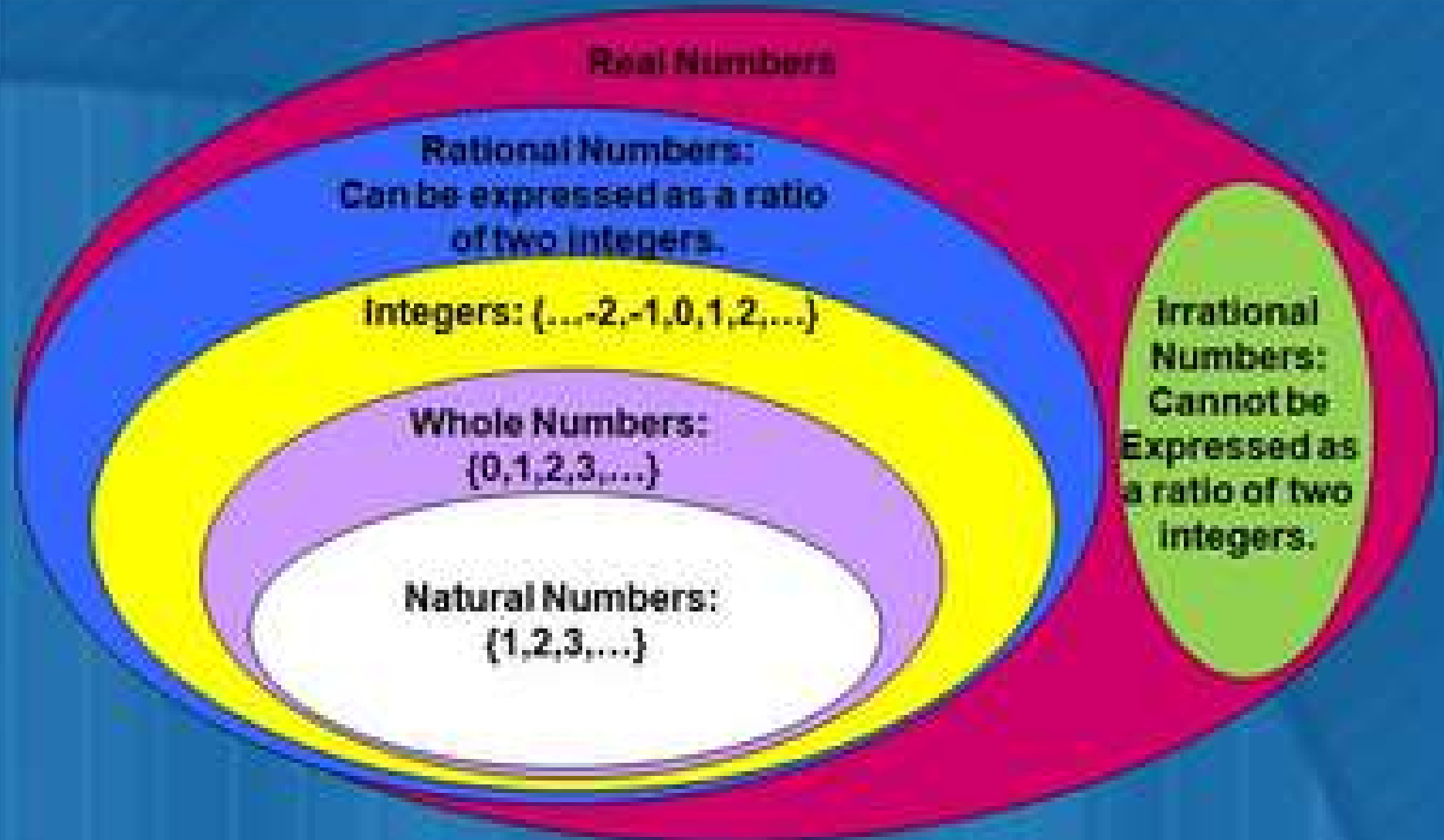
Real Numbers (R)

Rational Numbers (Q)
Any number that can be written as a fraction
*includes repeating decimals and decimals that terminate (end)

Integers (Z)
Counting numbers, their opposites, and 0
$-4, -3, -2, -1, 0, 1, 2, 3, 4 \ldots$

Whole Numbers (W)
Counting numbers and zero
$0, 1, 2, 3, 4 \ldots$

Natural Numbers (N)
Counting numbers
$1, 2, 3, 4 \ldots$

$\frac{3}{1}$

Irrational Numbers (I)

Indian Numeral System

TC	C	TL	L	TTh	Th	H	T	O
3	8	2	4	0	5	7	6	5

Crores   Lakhs   Thousands

Thirty eight crore twenty four lakh five thousand seven hundred and sixty five

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Decimal Place Value Chart

Millions	Hundred Thousands	Ten Thousands	Thousands	Hundreds	Tens	Ones	Decimal point	Tenths	Hundredths	Thousandth	Ten-Thousandth	Hundred-Thousandth	Millionths
Whole part							•	Decimal part					

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	Place value	Number	zeros
	Ones	1	0
	Tens	10	1
	Hundreds	100	2
Thousands	Thousands	1,000	3
	Ten Thousands	10,000	4
	Hundred Thousands	100,000	5
Millions	Million	1,000,000	6
	Ten Million	10,000,000	7
	Hundred Million	100,000,000	8
Billions	Billion	1,000,000,000	9
	Ten Billion	10,000,000,000	10
	Hundred Billion	100,000,000,000	11
Trillions	Trillion	1,000,000,000,000	12
	Ten Trillion	10,000,000,000,000	13
	Hundred Trillion	100,000,000,000,000	14

NUMBER CHART IN DIFFERENT LANGUAGE

Value	0	1	2	3	4	5	6	7	8	9
Western Arabic	٠	١	٢	٣	٤	٥	٦	٧	٨	٩
Eastern Arabic	٠	١	٢	٣	۴	۵	۶	٧	٨	٩
Devanagari	०	१	२	३	४	५	६	७	८	९
Gujarati	૦	૧	૨	૩	૪	૫	૬	૭	૮	૯
Gurmukhi	੦	੧	੨	੩	੪	੫	੬	੭	੮	੯
Limbu	᥆	᥇	᥈	᥉	᥊	᥋	᥌	᥍	᥎	᥏
Bengali	০	১	২	৩	৪	৫	৬	৭	৮	৯
Oriya	୦	୧	୨	୩	୪	୫	୬	୭	୮	୯
Telugu	౦	౧	౨	౩	౪	౫	౬	౭	౮	౯
Kannada	೦	೧	೨	೩	೪	೫	೬	೭	೮	೯
Malayalam	൦	൧	൨	൩	൪	൫	൬	൭	൮	൯
Tamil (Grantha)	௦	௧	௨	௩	௪	௫	௬	௭	௮	௯
Tibetan	༠	༡	༢	༣	༤	༥	༦	༧	༨	༩
Burmese	၀	၁	၂	၃	၄	၅	၆	၇	၈	၉
Thai	๐	๑	๒	๓	๔	๕	๖	๗	๘	๙
Khmer	០	១	២	៣	៤	៥	៦	៧	៨	៩
Lao	໐	໑	໒	໓	໔	໕	໖	໗	໘	໙

THANK YOU