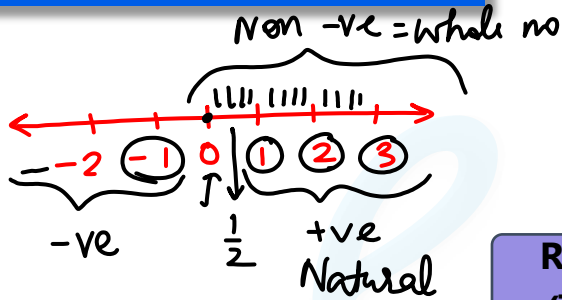


Classification of numbers

संख्याओं का वर्गीकरण

coaching center

Classification of numbers:



All numbers Complex numbers (सम्मिश्र संख्याएं)

Real
(वास्तविक)

Not Real
(गैर वास्तविक)

Rational
(परिमेय)

Irrational
(अपरिमेय)

Integers
(पूर्णांक)

Fractions
(भिन्न)

Negative
(ऋणात्मक)

Zero
(शून्य)

Positive
(धनात्मक)

Proper
(उचित)

Improper
(विषम)

Mixed
(मिश्रित)

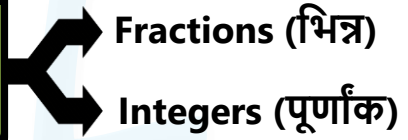
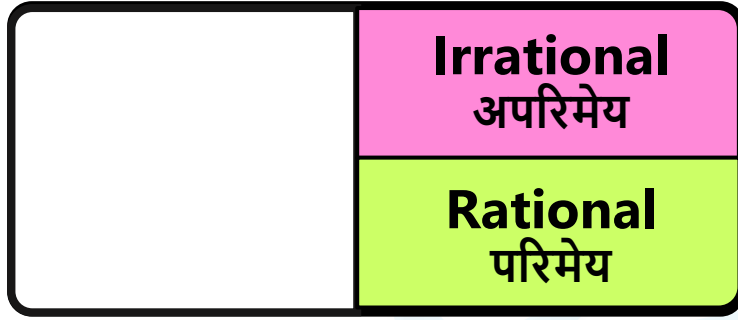
$\frac{2}{5}$, $\frac{3}{8}$, $\frac{1}{9}$
 < 1

$\frac{22}{7}$, $\frac{17}{3}$
 > 1

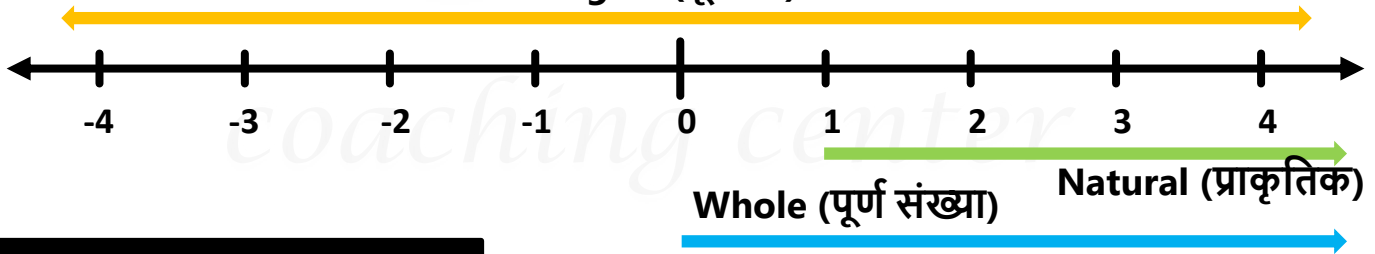
$5 + \frac{2}{3}$
 $\frac{2}{5}$, $\frac{3}{8}$, $\frac{17}{3}$
 $5\frac{2}{3}$

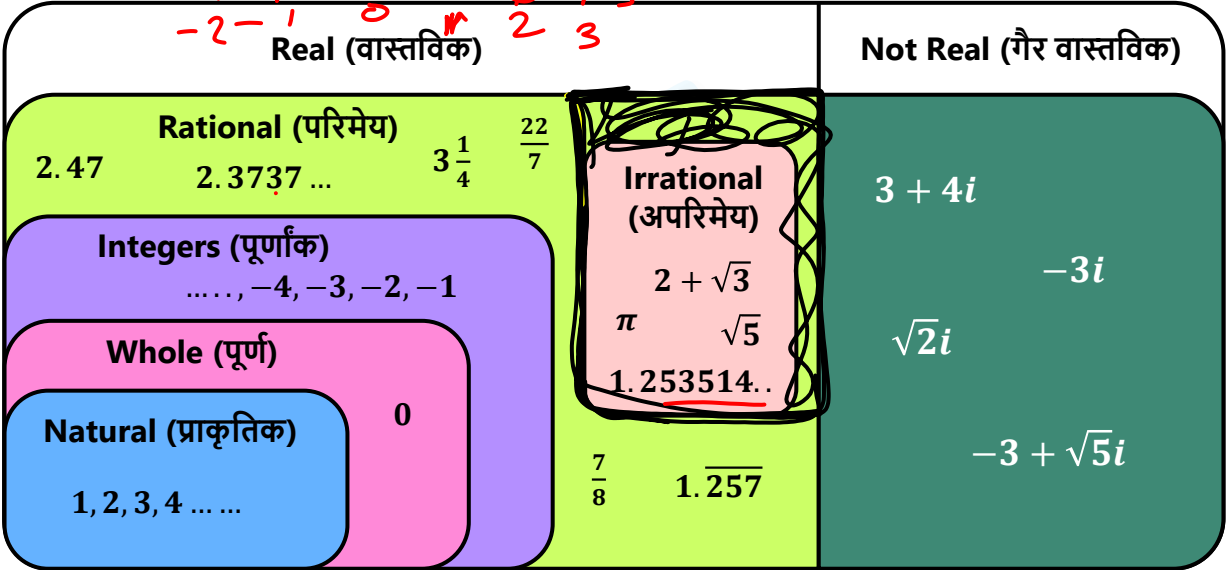
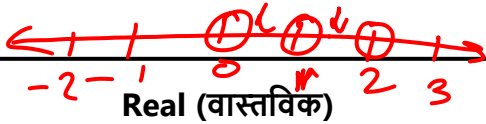
Not Real
गैर वास्तविक

Real
वास्तविक



Integers (पूर्णांक)





Coaching Center

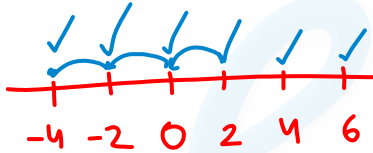
Further classification of numbers:

- **Even** (सम)
- **Odd** (विषम)
- **Prime** (अभाज्य)
- **Composite** (संयुक्त)
- **Co-Prime** (सह अभाज्य)
- **Perfect** (सम्पूर्ण)
- **Twin Prime** (जुड़वाँ अभाज्य)
- **Ramanujan** (रामानुजन)

coaching center

Even numbers (सम संख्याएं) :

Any number in the form of $2n$, where n is an integer.



$-3, -2, -1, 0, 1, 2, 3, ..$

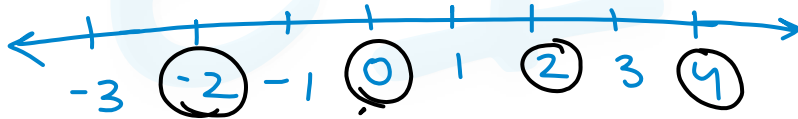
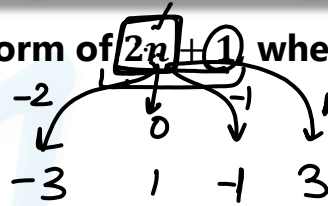
$-6, -4, -2, 0, 2, 4, 6, ..$

$$\frac{0}{2} = 0$$

coaching center

Odd numbers (विषम संख्याएं) :

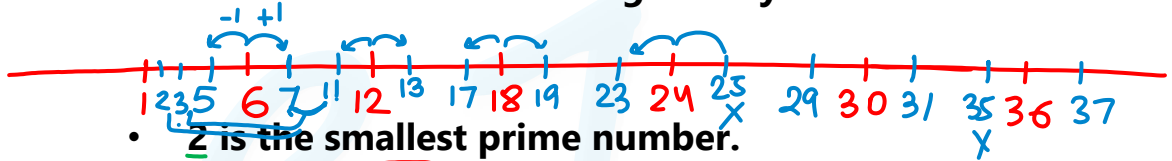
Any number in the form of $2n+1$ where n is an integer.



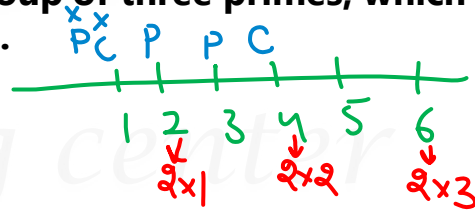
coaching center

Prime numbers (अभाज्य संख्याएं) :

A natural number having exactly 2 factors.



- 2 is the smallest prime number.
- 2 is only **even** prime number.
- All prime numbers (except 2 & 3) can be written in the form **$6n \pm 1$** or **$6n \pm 5$** , where n is a natural number.
- (3, 5, 7) is only group of three primes, which are consecutive odds.



Composite numbers (संयुक्त संख्याएं) :

A natural number having more than 2 factors.

- 1 is neither prime nor composite.

coaching center

Co – prime numbers (सह – अभाज्य संख्याएं) :

Numbers whose HCF is 1.

- Also called as Mutually prime or relatively prime.

coaching center

Perfect numbers (सम्पूर्ण/परिपूर्ण संख्याएं) :

A positive integer, whose sum of positive factors is double of itself. 28

$$\overbrace{1, 2, 4, 7, 14} 28$$

- Ex: 6, 28, 496, 8128,

$$\overbrace{1, 2, 3} 6 = 12$$

6 +

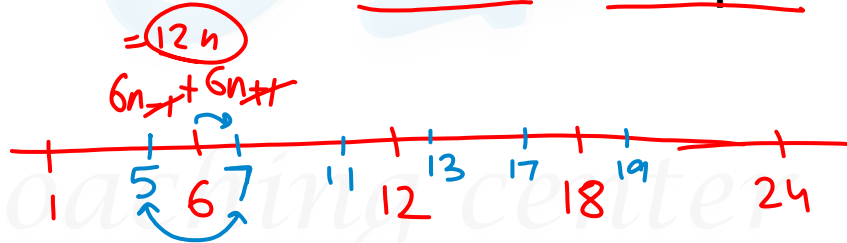
coaching center

Twin Prime numbers (जुड़वाँ अभाज्य संख्याएं) :

Two prime numbers with a difference of 2.



- 5 is the only prime, which is in 2 twin prime pairs.
- Sum of twin prime numbers (except 3 & 5) is always divisible by 12.
- Also called as Prime twin or Prime pairs.



Ramanujan Number (रामानुजन संख्या) :

$$1729 = (1)^3 + (12)^3$$
$$= (9)^3 + (10)^3$$

Hardy.

Also called as Taxicab / Hardy – Ramanujan number.

coaching center

Important Points:

$$\text{Even} + \text{Even} = \text{Even}$$

$$\text{Even} + \text{Odd} = \text{Odd}$$

$$\text{Odd} + \text{Odd} = \text{Even}$$

$$\text{Even} \times \text{Even} = \text{Even}$$

$$\text{Even} \times \text{Odd} = \text{Even}$$

$$\text{Odd} \times \text{Odd} = \text{Odd}$$

e e $5+23+17+19+231$

- Sum of ' n ' odd numbers is odd, if n is odd.
- Sum of ' n ' odd numbers is even, if n is even.

$$5+23-17-19+231-417$$

$$5+23+(-17)+(-19)$$

1. How many non-negative integers are not more than 40?

कितने गैर ऋणात्मक पूर्णांक संख्या 40 से अधिक नहीं है?

a) 39

b) 40

c) 41

d) Infinite

0, 1, 2, ..., 40

coaching center

2. How many whole numbers for 'x' satisfy the inequality $2x + 7 \leq 39$?

असमता $2x + 7 \leq 39$ को संतुष्ट करने वाले x के कितने मान पूर्ण संख्याएँ हैं?

a) 15

b) 16

c) 17

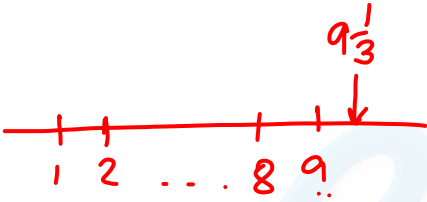
d) 24

0, 1, 2, 3, ..., 16

$$2x \leq 32$$

$$x \leq 16$$

coaching center



3. How many positive integers for 'p' satisfy the inequality $3p + 5 < 33$?

असमता $3p + 5 < 33$ को संतुष्ट करने वाले 'p' के कितने मान धनात्मक पूर्णांक हैं?

a) 8

b) 9

c) 10

d) 11

$$3p < 28$$

$$p < \frac{28}{3} = 9\frac{1}{3}$$

coaching center

4. How many positive even numbers are not more than 82?

कितनी धनात्मक सम संख्याएँ 82 से अधिक नहीं हैं?

a) 39

b) 40

c) 41

d) 82

2, 4, 6, ..., 82
↓
1st, 2nd, ..., 41st

coaching center

$$S_1 = \{1, 2, \dots, 51\} \Rightarrow 51 = X$$

$$S_2 = \{0, 1, 2, \dots, 81\} \Rightarrow 82 = Y$$

31

5. Let S_1 be the set of all positive integers less than 52 and S_2 be the set of all non-negative integers not more than 81. Let 'X' be the number of elements in S_1 and 'Y' be the number of elements in S_2 . Find $Y - X$?

S_1 एक समुच्चय है जिसमें 52 से छोटे सभी घनात्मक पूर्णांक हैं व S_2 एक दूसरा समुच्चय है जिसमें वो सभी गैर ऋणात्मक पूर्णांक हैं जो 81 से बड़े नहीं हैं। अगर समुच्चय S_1 में 'X' संख्याएं हैं व S_2 में 'Y' संख्याएं हैं तो 'Y - X' ज्ञात करें?

a) 29

b) 30

c) 31

d) 32

coaching center

754310

103457
↑↑

↓
3 2 4
→ 4
→ 20
→ 300

6. What is smallest six-digit number that can be formed using the digits 0, 1, 3, 4, 5, 7?

अंको 0, 1, 3, 4, 5, 7 से बनने वाली सबसे छोटी छः अंको की संख्या कौन सी होगी?

a) 134570

b) 103457

c) 175430

d) None

013457

00031

coaching center

7. If a & b are odd numbers, then which of the following is even?

यदि a और b विषम संख्या है, तो इसमें से सम संख्या कौन सी है?

$$a = 1$$
$$b = 3$$

~~a) $a + b + ab$~~

~~c) $a + b + 1$~~

$1 + 3 + 3 = 7$

$1 + 3 + 1$

~~b) $a + b = 1$~~

~~d) $a + b + 2ab$~~

$1 + 3 = 4$

$0 + 0 = 0$

$e, +$

coaching center

a, b, c
 $e, e, 0$

$$e^2 = e \times e$$

$$\underline{e} \times e = e$$

$$\underline{e} \times 0 = e$$

$$\underline{0} \times \underline{0} = 0$$

8. Let a & b be even integers and ' c ' be an odd integer, which of the following is odd?

अगर a और b सम संख्याएँ हैं व ' c ' एक विषम संख्या है तो निम्न में से कौन सी संख्या विषम है?

~~a) $ab + bc + ca$~~

~~b) $a^2 + b^2 + c^2$~~

~~c) $a^2b + b^2c + c^2a$~~

~~d) $a(b + c) + b(c + a) + c(a + b)$~~

coaching center

$$\left. \begin{array}{l} e+e=e \\ 0+0=e \end{array} \right\} x$$

$$e+0=0 \quad \checkmark$$

$$(-1)^5 = -1$$

$$(-1)^3 = -1$$

$$(-1)^4 = +1$$

q. If x and y are natural numbers such that $x + y = 2017$, then what is the value of $(-1)^x + (-1)^y$?

यदि x और y प्राकृतिक संख्याएँ इस प्रकार हैं की $x + y = 2017$ है, तो $(-1)^x + (-1)^y$ का मान क्या है?

a) 2

b) -2

c) 0

d) 1

$$(-1)^{\text{odd}} + (-1)^{\text{even}}$$

$$= -1 + 1 = 0$$

coaching center

10. If $2x + 3y$ is odd, which of the following must be true?

अगर $2x + 3y$ विषम है, तो निम्न में से कौन सा सत्य होगा?

~~a) x is even~~

b) y is even

~~c) x is odd~~

d) y is odd

$$\underbrace{2x}_{e} + \underbrace{3y}_{\text{odd}} = \text{odd}$$

$$3xy = \text{odd}$$

$$0 + e = o$$

$$o + o = e$$

$$e + e = e$$

coaching center