### Perfect cube

A natural no. is said to be a perfect cube if it is the cube of same natural no.

### Properties of perfect cube

- (i) Cube of even no is even.
- (ii) Cube of odd no. is odd
- (iii) Cube of negative no is negative.
- (iv) The sum of the cube of first n natural no. is equal to the squre of their sum.

$$1^3 + 2^3 + 3^3 + \dots + n^3 = (1 + 2 + 3 + \dots n)^2$$

(v) Cubes of the numbers ending in digits 1, 4, 5, 6 and 9 are the number ending in the same digit. Cubes of numbers ending in digit 2 ends in 8, and cube of numbers ending in digit 8 ends in 2. The cubes of the numbers ending in digits 3 and 7 ends in 7 and 3 respectively.

## **Cube roots**

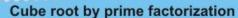
The cube root of a no. is x that no whose cube gives x.

Ex. Cube root of 8 is 2 because

$$2^3 = 8$$
  
 $3\sqrt{8} = 2$ 

## **Cube & Cube roots**

The cube of no. is obtained when no. is multiplied by itself 3 times. Cube of x is  $x \cdot x \cdot x$ 



$$3 \sqrt{\frac{-512}{125}} = \frac{\sqrt[3]{-512}}{\sqrt[3]{125}}$$
$$\frac{\sqrt[3]{-8 \times -8 \times -8}}{\sqrt[3]{5 \times 5 \times 5}} = -\frac{8}{5}$$

$$3\sqrt{216} = 3\sqrt{2 \times 2 \times 2 \times 3 \times 3 \times 3}$$
  
= 2 \times 3 = 6

# Cube by column method To find 25<sup>3</sup> take a = 2 b = 5

-3	2-2h	2 mb2	4.3
a°	3a²b	3ab²	p <sub>3</sub>
2 <sup>3</sup>	$3 \times 2^2 \times 5$	$3 \times 2 \times 5^2$	5 <sup>3</sup>
8	60	150	125
+7	+16	+12	
15	76	162	

$$25^3 = 15625$$

## Cube root by pattern

We have to successively subtract 1,7,19,37,61,91 ...... from number till we get zero. The no of time we subtract give the cube root.

Ex. 
$$\sqrt[3]{64}$$
 64 - 1 = 63  
63 - 7 = 56  
56 - 19 = 37  
37 - 37 = 0  
So  $\sqrt[3]{64}$  = 4