Cube & Cube roots

The cube of no. is obtained when no. is multiplied by itself 3 times. Cube of x is x ´ x ´ x

Chart

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.
$1^3 + 2^3 + 3^3 + ... + n^3 = (1 + 2 + 3 + ... n)^2$
(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 by column method

To find 25^3, take a = 2, b = 5

a^3	$3a^2b$	$3ab^2$	b^3
2^3	$3\times 2^2\times 5$	$3\times 2\times 5^2$	5^3
8	60	150	125
+7	+16	+12	
15	76	162	

$25^3 = 15625$

Cube roots

The cube root of a no. is x that no whose cube gives x.
Ex. Cube root of 8 is 2 because
$2^3 = 8$
$\sqrt[3]{8} = 2$

Cube root by prime factorization

Ex. $\sqrt[3]{216}$

2	216
2	108
2	54
3	27
3	3
3	3

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

Ex. $\sqrt[3]{\frac{-512}{125}} = \frac{\sqrt[3]{-512}}{\sqrt[3]{125}}$

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

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 $\sqrt[3]{64} = 4$