Cube and Cube roots

Cube Number

Numbers obtained when a number is multiplied by itself three times are known as cube numbers

Example

$1=1^3$

$8=2^3$

$27=3^3$

Some Important point to Note

S.no	Points
1	All cube numbers can end with any digit unlike square number when end with 0, 1, 4, 5, 6 or 9 at unit's place
2	if a number has 1 in the unit's place, then it's cube ends in 1.
5	Even number cubes are even while odd number cubes are Odd
6	There are only ten perfect cubes from 1 to 1000
7	There are only four perfect cubes from 1 to 100

Prime Factorization of Cubes

When we perform the prime factorization of cubes number, we find one special property

8= 2×2×2 (Triplet of prime factor 2)
216 = (2 × 2 × 2) × (3 × 3 × 3) (Triplet of 2 and 3)

Each prime factor of a number appears three times in the prime factorization of its cube.

Cube Root

Cube root of a number is the number whose cube is given number

So we know that

$27=3^3$

Cube root of 27

$\sqrt[3]{27} = 3$

Cube root is denoted by expression $\sqrt[3]{\ }$

How to Find cube root

Name	Description
Finding cube root through prime factorization	This method, we find the prime factorization of the number. We will get same prime number occurring in triplet for perfect cube number. Cube root will be given by multiplication of prime factor occurring in pair Consider $74088 = 2 \times 2 \times 2 \times 3 \times 3 \times 3 \times 7 \times 7 \times 7 = 2^3 \times 3^3 \times 7^3$ $\sqrt[3]{74088} = 2 \times 3 \times 7 = 42$
Finding cube root by estimation method	This can be well explained with the example The given number is 17576. **Step 1** Form groups of three starting from the rightmost digit of 17576. 17 576. In this case one group i.e., 576 has three digits whereas 17 has only two digits. **Step 2** Take 576. The digit 6 is at its one's place. We take the one's place of the required cube root as 6. **Step 3** Take the other group, i.e., 17. Cube of 2 is 8 and cube of 3 is 27. 17 lies between 8 and 27. The smaller number among 2 and 3 is 2. The one's place of 2 is 2 itself. Take 2 as ten's place of the cube root of 17576. Thus, $\sqrt[3]{17576} = 26$