Cube and Cube Roots

Introduction

$a \times a \times a = a^4$ read as “a raised to the power four”. a is called base and 4 is called power or exponent.

When the exponent is 3, the numbers thus obtained are called cube numbers.
The base is the cube root of the obtained cube number.

Cubes

Cube of a number is that number which is raised to the power 3.

$2 \times 2 \times 2 = 2^3 = 8$ is called cube of 2 is 8

$3 \times 3 \times 3 = 3^3 = 27$ is called cube of 3 is 27

The square of a number is that number raised to the power 3.

Perfect Cube

A natural number is called a perfect cube or a cube number if it is the cube of some natural number. It is also known as the perfect cube.

How to find whether a given number is a perfect cube

Step 1 : Write the given number as a product of its prime factors.
Step 2 : Make triplets of the same numbers of prime factors.
Step 3 : Check for non triplet factors.
Step 4 : If there is no triplet factors, then the number will be a perfect cube.

Properties of Perfect Cubes

1. Cube of an even natural number is even.
2. The cube of an odd natural number is odd.

3. The cube of a negative integer is negative.
4. Cube of the numbers ending in 1, 4, 5, 6, 9 are the numbers ending with the same digit..
5. Cube of a n umbers ending in 2 and 8 are the numbers ending in 8 and 2 respectively.
6. Cube of a numbers ending in 3 and 7 are the numbers ending in 7 and 3 respectively.
7. The cube of a rational number $\frac{p}{q}$ is given by $(\frac{p}{q})^3 = \frac{p^3}{q^3}$ when $q \neq 0$

Perfect cube testing

A given natural number is a perfect cube if it can be expressed as the product of three identical factors.

Cube roots

The cube root of a given number x is that number y whose cube gives the number x.

The square root of a number x is represented as $\sqrt[3]{x}$.
The symbol $\sqrt[3]{\ }$ stands for cube root of.

Cube root of a perfect cube by Prime Factorization Method

Step 1: Factorize the given number by prime factors
Step 2: Make triplets of similar factors.
Step 3: Select one factor from each group and multiply them.
Step 4: The product is the cube root of the given number.

Cube of negative integers

The cube of negative integers is always negative.

Cube of rational number

The cube of a rational number $\frac{p}{q}$ is given by $(\frac{p}{q})^3 = (\frac{p^3}{q^3}) = \frac{p \times p \times p}{q \times q \times q}$ when $q \neq 0$

Cube root by short cut method

We know
$(a+b)^3 = a^3 + 3a^2b + 3ab^2 + b^3$

Two digit number with tens digit a and units digit b.

Step 1 : Make four columns I, II, III and IV.

Step 2 : In column IV kept aside the unit's digit of b^3 and carry the other digits to column III and sum with the value of $3ab^2$.

Step 3 : Again in column III kept aside the unit digit of the obtained number and again carry the other digits to the next column.

Step 4 : Continue this process till you reach column I. The digits thus obtained give required cube number.