



Cubes and Cubes Roots Ex 4.1 Q1

Answer :

Cube of a number is given by the number raised to the power three.

(i) Cube of $7 = 7^3 = 7 \times 7 \times 7 = 343$

(ii) Cube of $12 = 12^3 = 12 \times 12 \times 12 = 1728$

(iii) Cube of $16 = 16^3 = 16 \times 16 \times 16 = 4096$

(iv) Cube of $21 = 21^3 = 21 \times 21 \times 21 = 9261$

(v) Cube of $40 = 40^3 = 40 \times 40 \times 40 = 64000$

(vi) Cube of $55 = 55^3 = 55 \times 55 \times 55 = 166375$

(vii) Cube of $100 = 100^3 = 100 \times 100 \times 100 = 1000000$

(viii) Cube of $302 = 302^3 = 302 \times 302 \times 302 = 27543608$

(ix) Cube of $301 = 301^3 = 301 \times 301 \times 301 = 27270901$

Cubes and Cubes Roots Ex 4.1 Q2

Answer :

The cubes of natural numbers between 1 and 10 are listed and classified in the following table.

We can classify all natural numbers as even or odd number; therefore, to check whether the cube of a natural number is even or odd, it is sufficient to check its divisibility by 2.

If the number is divisible by 2, it is an even number, otherwise it will be an odd number.

(i) From the above table, it is evident that cubes of all odd natural numbers are odd.

(ii) From the above table, it is evident that cubes of all even natural numbers are even.

Number	Cube	Classification
1	1	Odd
2	8	Even (Last digit is even, i.e., 0, 2, 4, 6, 8)
3	27	Odd (Not an even number)
4	64	Even (Last digit is even, i.e., 0, 2, 4, 6, 8)
5	125	Odd (Not an even number)
6	216	Even (Last digit is even, i.e., 0, 2, 4, 6, 8)
7	343	Odd (Not an even number)
8	512	Even (Last digit is even, i.e., 0, 2, 4, 6, 8)
9	729	Odd (Not an even number)
10	1000	Even (Last digit is even, i.e., 0, 2, 4, 6, 8)

Cubes and Cubes Roots Ex 4.1 Q3

Answer :

Extend the pattern as follows:

$$\begin{aligned}1^3 &= 1 \\1^3 + 2^3 &= (1 + 2)^2 \\1^3 + 2^3 + 3^3 &= (1 + 2 + 3)^2 \\1^3 + 2^3 + 3^3 + 4^3 &= (1 + 2 + 3 + 4)^2 \\1^3 + 2^3 + 3^3 + 4^3 + 5^3 &= (1 + 2 + 3 + 4 + 5)^2 \\1^3 + 2^3 + 3^3 + 4^3 + 5^3 + 6^3 &= (1 + 2 + 3 + 4 + 5 + 6)^2\end{aligned}$$

Now, from the above pattern, the required value is given by:

$$\begin{aligned}1^3 + 2^3 + 3^3 + 4^3 + 5^3 + 6^3 + 7^3 + 8^3 + 9^3 + 10^3 \\= (1 + 2 + 3 + 4 + 5 + 6 + 7 + 8 + 9 + 10)^2 = 55^2 = 3025\end{aligned}$$

Thus, the required value is 3025.

Cubes and Cubes Roots Ex 4.1 Q4

Answer :

Five natural numbers, which are multiples of 3, are 3, 6, 9, 12 and 15.

Cubes of these five numbers are:

$$\begin{aligned}3^3 &= 3 \times 3 \times 3 = 27 \\6^3 &= 6 \times 6 \times 6 = 216 \\9^3 &= 9 \times 9 \times 9 = 729 \\12^3 &= 12 \times 12 \times 12 = 1728 \\15^3 &= 15 \times 15 \times 15 = 3375\end{aligned}$$

Now, let us write the cubes as a multiple of 27. We have:

$$\begin{aligned}27 &= 27 \times 1 \\216 &= 27 \times 8 \\729 &= 27 \times 27 \\1728 &= 27 \times 64 \\3375 &= 27 \times 125\end{aligned}$$

It is evident that the cubes of the above multiples of 3 could be written as multiples of 27. Thus, it is verified that the cube of a natural number, which is a multiple of 3, is a multiple of 27.

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