

CUBES AND CUBE ROOTS

PERIOD 2

SUBJECT : MATHEMATICS
CHAPTER NUMBER: 4
CHAPTER NAME : CUBES AND CUBE ROOTS

CHANGING YOUR TOMORROW

Previous concept

- A perfect cube is a number which is equal to the number, multiplied by itself, three times.
- If x is a perfect cube of y , then $x = y^3$.
- Ex: Is the number 600 a perfect cube?

Sol: $600 = 2 \times 2 \times 2 \times 3 \times 5 \times 5 = 2^3 \times 3 \times 5^2$

The number 600 is not a perfect cube as all the prime factors is not a multiple of three.

Learning outcome

- ❑ Students will be to find the cube root of a perfect cube using prime factorization method.

To find the cube root using prime factorisation method

We can find the cube-root of a number by the method of prime factorisation. Consider the following example for a clear understanding:

$$2744 = 2 \times 2 \times 2 \times 7 \times 7 \times 7 = (2 \times 7)^3$$

Therefore, the cube root of 2744 = $\sqrt[3]{2744} = 2 \times 7 = 14$

Exercise-4(A)

7. Find the least number by which 1323 must be multiplied so that the product is a perfect cube.

Sol: The prime factor of 1323 are
 $= 3 \times 3 \times 3 \times 7 \times 7 = (3 \times 3 \times 3) \times 7 \times 7$

Clearly, 1323 must be multiplied by 7.

8. Find the smallest number by which 8768 must be divided so that the quotient is a perfect cube.

Sol: $8768 = 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 137 = (2 \times 2 \times 2) \times (2 \times 2 \times 2) \times 137$

Clearly, 8768 must be divided by 137

Evaluation Questions

Exercise-4(A)

6. Which of the following are cubes of?

(i) An even number

(ii) An odd number

216, 729, 3375, 8000, 125, 343, 4096 and 9261

Sol: (i) Cubes of an even number are 216, 8000, 4096

(ii) Cubes of an odd number are 729, 3375, 125, 343, 9261

Home assignment

Exercise 4(A) – Q No 9 to 511

AHA

1. Parikshit makes a cuboid of plasticine of sides 5 cm, 2 cm, 5 cm. How many such cuboids will he need to form a cube?
2. Find the smallest number by which 128 must be divided to obtain a perfect cube.
3. Is 392 a perfect cube? If not, find the smallest natural number by which 392 should be multiplied so that the product is a perfect cube.

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