

NCERT SOLUTIONS OF Cube Roots

Exercise 2

Question 1

Find the cube root of each of the following numbers by prime factorization method.

(i) 64

(ii) 512

(iii) 10648

(iv) 27000

(v) 15625

(vi) 13824

(vii) 110592

(viii) 46656

(ix) 175616

(x) 91125

Answer

Converting the number into common factors

i) $64 = 2 \times 2 \times 2 \times 2 \times 2 \times 2$

$$= 2^3 \times 2^3$$

$${}^3\sqrt{64} = 2 \times 2 = 4$$

ii) $512 = 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2$

$$= 2^3 \times 2^3 \times 2^3$$

$${}^3\sqrt{512} = 2 \times 2 \times 2 = 8$$

$$\text{iii) } 10648 = 2 \times 2 \times 2 \times 11 \times 11 \times 11$$

$$= 2^3 \times 11^3$$

$$\sqrt[3]{10648} = 2 \times 11 = 22$$

$$\text{iv) } 27000 = 2 \times 2 \times 2 \times 3 \times 3 \times 3 \times 5 \times 5 \times 5$$

$$= 2^3 \times 3^3 \times 5^3$$

$$\sqrt[3]{27000} = 2 \times 3 \times 5 = 30$$

$$\text{v) } 15625 = 5 \times 5 \times 5 \times 5 \times 5 \times 5$$

$$= 5^3 \times 5^3$$

$$\sqrt[3]{15625} = 5 \times 5 = 25$$

$$\text{vi) } 13824 = 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 3 \times 3 \times 3$$

$$= 2^3 \times 2^3 \times 2^3 \times 3^3$$

$$\sqrt[3]{13824} = 2 \times 2 \times 2 \times 3 = 24$$

$$\text{vii) } 110592 = 2^3 \times 2^3 \times 2^3 \times 2^3 \times 3^3$$

$$\sqrt[3]{110592} = 2 \times 2 \times 2 \times 2 \times 3 = 48$$

$$\text{viii) } 46656 = 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 3 \times 3 \times 3 \times 3 \times 3 \times 3$$

$$= 2^3 \times 2^3 \times 3^3 \times 3^3$$

$$\sqrt[3]{46656} = 2 \times 2 \times 3 \times 3 = 36$$

ix) $175616 = 2^3 \times 2^3 \times 2^3 \times 7^3$

$$\sqrt[3]{175616} = 2 \times 2 \times 2 \times 7 = 56$$

x) $91125 = 5^3 \times 3^3 \times 3^3$

$$\sqrt[3]{91125} = 5 \times 3 \times 3 = 45$$

Question 2

State true or false.

- (i) Cube of any odd number is even.
- (ii) A perfect cube does not end with two zeros.
- (iii) If square of a number ends with 5, then its cube ends with 25.
- (iv) There is no perfect cube which ends with 8.
- (v) The cube of a two digit number may be a three digit number.
- (vi) The cube of a two digit number may have seven or more digits.
- (vii) The cube of a single digit number may be a single digit number.

Answer:

- i) As Odd multiplied by odd is always odd, So this statement is false
- ii) A perfect cube will end with odd number of zeroes for example 10, the cube will be 1000. So this statement is true
- iii) False

iv) As $2^3 = 8$, This statement is false

v) The smallest two digit number is 10 and $10^3 = 1000$ is a not three digit number. So this statement is false

vi) 99 is the largest 2 digit number; $99^3 = 989901$ is a 6 digit number. So this statement is false

vii) As $2^3 = 8$ is a single digit number, This statement is true

Question 3

You are told that 1,331 is a perfect cube. Can you guess without factorization what is its cube root? Similarly, guess the cube root of 4913.

Answer:

We can estimate the cube root by the splitting the number from the right into three digit numbers

So for 1331

Left group 1

Right group 331

As you know $1^3 = 1$ so there would be 1 at unit's place in cube root of 1331.

Now we have to find the cube root of left group 1

Now $1^3 = 1$

So, we have 1 in ten's place and 1 in unit place

$11^3 = 1331$ satisfies the condition

4913:

Right group = 913

Left group = 4

7^3 gives 3 at unit's place so unit digit number in cube root of 4913 should be 7

We have to estimate the cube root of left group i.e 4

$1^3 = 1$ and $2^3 = 8$

$1 < 4 < 8$

So, 10s digit in cube root of 4913 should be 1

So answer is 17

physicscatalyst.com