## Exercise 7.2

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**1. Find the cube root of each of the following numbers by prime factorisation method.**

**(i) 64**

Solution:

$64 = 2\times2\times2\times2\times2\times2$

By grouping the factors in triplets of equal factors, $64 = (2\times2\times2)\times(2\times2\times2)$

Here, 64 can be grouped into triplets of equal factors,

$\therefore 64 = 2\times2 = 4$

Hence, 4 is cube root of 64.

**(ii) 512**

Solution:

$512 = 2\times2\times2\times2\times2\times2\times2\times2\times2$

By grouping the factors in triplets of equal factors, $512 = (2\times2\times2)\times(2\times2\times2)\times(2\times2\times2)$

Here, 512 can be grouped into triplets of equal factors,

$\therefore 512 = 2\times2\times2 = 8$

Hence, 8 is cube root of 512.

**(iii) 10648**

Solution:

$10648 = 2\times2\times2\times11\times11\times11$

By grouping the factors in triplets of equal factors,

$10648 = (2\times2\times2)\times(11\times11\times11)$

Here, 10648 can be grouped into triplets of equal factors,

$\therefore 10648 = 2\times11 = 22$

Hence, 22 is cube root of 10648.

**(iv) 27000**

Solution:

$27000 = 2\times2\times2\times3\times3\times3\times3\times5\times5\times5$

By grouping the factors in triplets of equal factors,

$27000 = (2\times2\times2)\times(3\times3\times3)\times(5\times5\times5)$

Here, 27000 can be grouped into triplets of equal factors,

$\therefore 27000 = (2\times3\times5) = 30$

Hence, 30 is cube root of 27000.

**(v) 15625**

Solution:

$15625 = 5\times5\times5\times5\times5\times5$

By grouping the factors in triplets of equal factors,

$15625 = (5\times5\times5)\times(5\times5\times5)$

Here, 15625 can be grouped into triplets of equal factors,

$\therefore 15625 = (5\times5) = 25$

Hence, 25 is cube root of 15625.

**(vi) 13824**

Solution:

$13824 = 2\times2\times2\times2\times2\times2\times2\times2\times2\times3\times3\times3$

By grouping the factors in triplets of equal factors,

$13824 = (2\times2\times2)\times(2\times2\times2)\times(2\times2\times2)\times(3\times3\times3)$

Here, 13824 can be grouped into triplets of equal factors,

$\therefore 13824 = (2\times2\times 2\times3) = 24$

Hence, 24 is cube root of 13824.

**(vii) 110592**

Solution:

$110592 = 2\times2\times2\times2\times2\times2\times2\times2\times2\times2\times2\times3\times3\times3$

By grouping the factors in triplets of equal factors,

$110592 = (2\times2\times2)\times(2\times2\times2)\times(2\times2\times2)\times(2\times2\times2)\times(3\times3\times3)$

Here, 110592 can be grouped into triplets of equal factors,

$\therefore 110592 = (2\times2\times2\times2\times3) = 48$

Hence, 48 is cube root of 110592.

**(viii) 46656**

Solution:

$46656 = 2\times2\times2\times2\times2\times2\times3\times3\times3\times3\times3\times3$

By grouping the factors in triplets of equal factors,

$46656 = (2\times2\times2)\times(2\times2\times2)\times(3\times3\times3)\times(3\times3\times3)$

Here, 46656 can be grouped into triplets of equal factors,

$\therefore 46656 = (2\times2\times3\times3) = 36$

Hence, 36 is cube root of 46656.

**(ix) 175616**

Solution:

$175616 = 2\times2\times2\times2\times2\times2\times2\times2\times2\times7\times7\times7$

By grouping the factors in triplets of equal factors,

$175616 = (2\times2\times2)\times(2\times2\times2)\times(2\times2\times2)\times(7\times7\times7)$

Here, 175616 can be grouped into triplets of equal factors,

$\therefore 175616 = (2\times2\times2\times7) = 56$

Hence, 56 is cube root of 175616.

**(x) 91125**

Solution:

$91125 = 3\times3\times3\times3\times3\times3\times3\times5\times5\times5$

By grouping the factors in triplets of equal factors,

$91125 = (3\times3\times3)\times(3\times3\times3)\times(5\times5\times5)$

Here, 91125 can be grouped into triplets of equal factors,

$\therefore 91125 = (3\times3\times5) = 45$

Hence, 45 is cube root of 91125.

**2. State true or false.**

**(i) Cube of any odd number is even.**

Solution:

False

**(ii) A perfect cube does not end with two zeros.**

Solution:

True

**(iii) If square of a number ends with 5, then its cube ends with 25.**

Solution:

False

**(iv) There is no perfect cube which ends with 8.**

Solution:

False

**(v) The cube of a two digit number may be a three digit number.**

Solution:

False

**(vi) The cube of a two digit number may have seven or more digits.**

Solution:

False

**(vii) The cube of a single digit number may be a single digit number.**

Solution:

True

**3. You are told that 1,331 is a perfect cube. Can you guess without factorisation what is its cube root? Similarly, guess the cube roots of 4913, 12167, 32768.**

Solution:

(i) By grouping the digits, we get 1 and 331

We know that, since, the unit digit of cube is 1, the unit digit of cube root is 1.

∴ We get 1 as unit digit of the cube root of 1331.

The cube of 1 matches with the number of second group.

∴ The ten's digit of our cube root is taken as the unit place of smallest number.

We know that, the unit's digit of the cube of a number having digit as unit's place 1 is 1.

$\therefore \sqrt[3]{1331} = 11$

(ii) By grouping the digits, we get 4 and 913

We know that, since, the unit digit of cube is 3, the unit digit of cube root is 7.

∴ we get 7 as unit digit of the cube root of 4913. We know $1^3 = 1$ and $2^3 = 8$ , $1 > 4 > 8$.

Thus, 1 is taken as ten digit of cube root.

$\therefore \sqrt[3]{4913} = 17$

(iii) By grouping the digits, we get 12 and 167.

We know that, since, the unit digit of cube is 7, the unit digit of cube root is 3.

∴ 3 is the unit digit of the cube root of 12167 We know $2^3 = 8$ and $3^3 = 27$ , $8 > 12 > 27$.

Thus, 2 is taken as ten digit of cube root.

$\therefore \sqrt[3]{12167} = 23$

(iv) By grouping the digits, we get 32 and 768.

We know that, since, the unit digit of cube is 8, the unit digit of cube root is 2.

$\therefore$ 2 is the unit digit of the cube root of 32768. We know $3^3 = 27$ and $4^3 = 64$ , $27 > 32 > 64$.

Thus, 3 is taken as ten digit of cube root.

$\therefore \sqrt[3]{32768} = 32$