

Important Questions Class 8 Maths Chapter 6

Cube and Cube Roots

Question 1: A cuboid of plasticine made by Parikshit with sides 5 cm, 2 cm, and 5 cm. How many such cuboids will be needed to form a cube?

Answer 1: The given side of the cube is 5 cm, 2 cm and 5 cm.

Therefore, volume of cube = $5 \times 2 \times 5 = 50$

The prime factorisation of $50 = 2 \times 5 \times 5$

Here, 2, 5 and 5 cannot be grouped into triples of equal factors.

Therefore, we will multiply 50 by $2 \times 2 \times 5 = 20$ to get the perfect square.

Hence, 20 cuboids are needed to form a cube.

Question 2: State true or false.

(i) The cube of any odd number is even

(ii) A perfect cube never ends with two zeros.

(iii) If the 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 2:

(i) This statement is false.

Taking a cube of any required odd numbers

$$3^3 = 3 \times 3 \times 3 = 27$$

$$7^3 = 7 \times 7 \times 7 = 343$$

$$5^3 = 5 \times 5 \times 5 = 125$$

All the required cubes of any given odd number will always be odd.

(ii) This statement is true.

$$10^3 = 10 \times 10 \times 10 = 1000$$

$$20^3 = 20 \times 20 \times 20 = 2000$$

$$150^3 = 150 \times 150 \times 150 = 3375000$$

Hence a perfect cube will never end with two zeros.

(iii) This statement is false.

$$15^2 = 15 \times 15 = 225$$

$$15^3 = 15 \times 15 \times 15 = 3375$$

Thus, the square of any given number ends with 5; then the cube ends with the number 25 is an incorrect statement.

(iv) This statement is false.

$$2^3 = 2 \times 2 \times 2 = 8$$

$$12^3 = 12 \times 12 \times 12 = 1728$$

Accordingly, There are perfect cubes ending with the number 8

(v) This statement is false.

The minimum two digits number is 10

And

$$10^3 = 1000 \rightarrow 4 \text{ Digit number.}$$

The maximum two digits number is 99

And

$$99^3 = 970299 \rightarrow 6 \text{ Digit number}$$

Accordingly, the cube of two-digit numbers can never be a three-digit number.

(vi) This statement is false

$$10^3 = 1000 \rightarrow 4 \text{ Digit number.}$$

The maximum two digits number is 99

And

$$99^3 = 970299 \rightarrow 6 \text{ Digit number}$$

Accordingly, the cube of two-digit numbers can never have seven or more digits.

(vii) This statement is true

$$1^3 = 1 \times 1 \times 1 = 1$$

$$2^3 = 2 \times 2 \times 2 = 8$$

According to the cube, a single-digit can be a single-digit number.

Question 3: Find the cube root of 91125 by the prime factorisation method.

Answer 3: $91125 = 3 \times 3 \times 3 \times 3 \times 3 \times 3 \times 3 \times 5 \times 5 \times 5$

By grouping the factors in triplets of equal factors, $91125 = (3 \times 3 \times 3) \times (3 \times 3 \times 3) \times (5 \times 5 \times 5)$

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

$$\therefore 91125 = (3 \times 3 \times 5) = 45$$

Thus, 45 is the cube root of 91125.

Question 4: Find the cube of 3.5.

Answer 4: $3.5^3 = 3.5 \times 3.5 \times 3.5$

$$= 12.25 \times 3.5$$

$$= 42.875$$

Question 5: $(1.2)^3 =$ _____.

Answer 5: $(1.2)^3 = 12/10$

$$= (12/10) \times (12/10) \times (12/10)$$

$$= 1728/1000$$

$$= 1.728$$

Question 6: There are _____ perfect cubes between 1 and 1000.

Answer 6:

There are 8 perfect cubes between 1 and 1000.

$$2 \times 2 \times 2 = 8$$

$$3 \times 3 \times 3 = 27$$

$$4 \times 4 \times 4 = 64$$

$$5 \times 5 \times 5 = 125$$

$$6 \times 6 \times 6 = 216$$

$$7 \times 7 \times 7 = 343$$

$$8 \times 8 \times 8 = 512$$

$$9 \times 9 \times 9 = 729$$

Question 7: The cube of 100 will have _____ zeroes.

Answer 7: The cube of 100 will have six zeroes.

$$= 100^3$$

$$= 100 \times 100 \times 100$$

$$= 1000000$$

Question 8: 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.

Answer 8: The prime factorisation of 392 gives:

$$392 = 2 \times 2 \times 2 \times 7 \times 7$$

As we can see, number 7 cannot be paired in a group of three. Therefore, 392 is not a perfect cube.

We must multiply the 7 by the original number to make it a perfect cube.

Thus,

$2 \times 2 \times 2 \times 7 \times 7 \times 7 = 2744$, which is a perfect cube, such as 23×73 or 143 .

Hence, the smallest natural number, which should be multiplied by 392 to make a perfect cube, is 7 .

Question 9: Find the cube root of 10648 by the prime factorisation method.

Answer 9: $10648 = 2 \times 2 \times 2 \times 11 \times 11 \times 11$

Grouping the factors in triplets of number equal factors,

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

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

$$\therefore 10648 = 2 \times 11 = 22$$

Therefore, the cube root of 10648 is 22 .

Question 10: Which of the following numbers are in perfect cubes? In the case of a perfect cube, find the number whose cube is the given number 256

Answer 10: A perfect cube can be expressed as a product of three numbers of equal factors

Resolving the given number into prime factors, we obtain

$$256 = 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2$$

Since the number 256 has more than three factors

$\therefore 256$ is not a perfect cube.

Question 11: $(13/10)^3$

Answer 11: The cube of a rational number is the result of multiplying a number by itself three times.

To evaluate the cube of $(13/10)^3$

Firstly we need to convert into proper fractions, i.e. $(13/10)^3$

We need to multiply the given number three times, i.e. $(13/10) \times (13/10) \times (13/10) =$

$$(2197/1000)$$

\therefore the cube of $(1 \frac{3}{10})$ is $(2197/1000)$

Question 12: Find the smallest number by which 128 must be divided to get a perfect cube.

Answer 12: The prime factorisation of 128 is given by:

$$128 = 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2$$

By grouping the factors in triplets of equal factors,

$$128 = (2 \times 2 \times 2) \times (2 \times 2 \times 2) \times 2$$

Here, 2 cannot be grouped into triples of equal factors.

Therefore, to obtain a perfect cube, we will divide 128 by 2.

Question 13: Find out the cube root of 13824 by the prime factorisation method.

Answer 13: First, let us prime factorise 13824:

$$13824 = 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 3 \times 3 \times 3$$

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

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