

Exercise 6.1 (Revised) - Chapter 7 - Cube & Cube Roots - Ncert Solutions class 8 - Maths

Updated On 11-02-2025 By Lithanya

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Chapter 6 - Cube & Cube Roots | NCERT Solutions for Class 8 Maths

Ex 6.1 Question 1.

Which of the following numbers are not perfect cubes:

- (i) 216
- (ii) 128
- (iii) 1000
- (iv) 100
- (v) 46656

Answer.

(i) 216

| | |
|---|-----|
| 2 | 216 |
| 2 | 108 |
| 2 | 54 |
| 3 | 27 |
| 3 | 9 |
| 3 | 3 |
| | 1 |

Prime factors of $216 = 2 \times 2 \times 2 \times 3 \times 3 \times 3$
Here all factors are in groups of 3's (in triplets) Therefore, 216 is a perfect cube number.

(ii) 128

| | |
|---|-----|
| 2 | 128 |
| 2 | 64 |
| 2 | 32 |
| 2 | 16 |
| 2 | 8 |
| 2 | 4 |
| 2 | 2 |
| | 1 |

Prime factors of $128 = 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2$
Here one factor 2 does not appear in a 3's group.

Therefore, 128 is not a perfect cube.
(iii) 1000

| | |
|---|------|
| 2 | 1000 |
| 2 | 500 |
| 2 | 250 |
| 5 | 125 |
| 5 | 25 |
| 5 | 5 |
| | 1 |

Prime factors of 1000 = $2 \times 2 \times 2 \times 5 \times 5 \times 5$
Here all factors appear in 3's group.
Therefore, 1000 is a perfect cube.

(iv) 100

| | |
|---|-----|
| 2 | 100 |
| 2 | 50 |
| 5 | 25 |
| 5 | 5 |
| | 1 |

Prime factors of 100 = $2 \times 2 \times 5 \times 5$
Here all factors do not appear in 3's group. Therefore, 100 is not a perfect cube.

(v) 46656

| | |
|---|-------|
| 2 | 46656 |
| 2 | 23328 |
| 2 | 11664 |
| 2 | 5832 |
| 2 | 2916 |
| 2 | 1458 |
| 3 | 729 |
| 3 | 243 |
| 3 | 81 |
| 3 | 27 |
| 3 | 9 |
| 3 | 3 |
| | 1 |

Prime factors of 46656 = $2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 3 \times 3 \times 3 \times 3 \times 3 \times 3$
Here all factors appear in 3 's group.
Therefore, 46656 is a perfect cube.

Ex 6.1 Question 2.

Find the smallest number by which each of the following numbers must be multiplied to obtain a perfect cube:

- (i) 243
- (ii) 256
- (iii) 72
- (iv) 675
- (v) 100

Answer.

- (i) 243

| | |
|---|-----|
| 3 | 243 |
| 3 | 81 |
| 3 | 27 |
| 3 | 9 |
| 3 | 3 |
| | 1 |

Prime factors of $243 = 3 \times 3 \times 3 \times 3 \times 3$

Here 3 does not appear in 3's group.

Therefore, 243 must be multiplied by 3 to make it a perfect cube.

(ii) 256

| | |
|---|-----|
| 2 | 256 |
| 2 | 128 |
| 2 | 64 |
| 2 | 32 |
| 2 | 16 |
| 2 | 8 |
| 2 | 4 |
| 2 | 2 |
| | 1 |

Prime factors of $256 = 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2$

Here one factor 2 is required to make a 3 's group.

Therefore, 256 must be multiplied by 2 to make it a perfect cube.

(iii) 72

| | |
|---|----|
| 2 | 72 |
| 2 | 36 |
| 2 | 18 |
| 3 | 9 |
| 3 | 3 |
| | 1 |

Prime factors of $72 = 2 \times 2 \times 2 \times 3 \times 3$

Here 3 does not appear in 3's group.

Therefore, 72 must be multiplied by 3 to make it a perfect cube.

(iv) 675

| | |
|---|-----|
| 3 | 675 |
| 3 | 225 |
| 3 | 75 |
| 5 | 25 |
| 5 | 5 |
| | 1 |

Prime factors of $675 = 3 \times 3 \times 3 \times 5 \times 5$

Here factor 5 does not appear in 3 's group.

Therefore 675 must be multiplied by 5 to make it a perfect cube.

(v) 100

| | |
|---|-----|
| 2 | 100 |
| 2 | 50 |
| 5 | 25 |
| 5 | 5 |
| | 1 |

Prime factors of $100 = 2 \times 2 \times 5 \times 5$

Here factor 2 and 5 both do not appear in 3's group.

Therefore 100 must be multiplied by $2 \times 5 = 10$ to make it a perfect cube.

Ex 6.1 Question 3.

Find the smallest number by which each of the following numbers must be divided to obtain a perfect cube:

- (i) 81
- (ii) 128
- (iii) 135
- (iv) 192
- (v) 704

Answer.

- (i) 81

| | |
|---|----|
| 3 | 81 |
| 3 | 27 |
| 3 | 9 |
| 3 | 3 |
| | 1 |

Prime factors of $81 = 3 \times 3 \times 3 \times 3$

Here one factor 3 is not grouped in triplets.

Therefore 81 must be divided by 3 to make it a perfect cube.

- (ii) 128

| | |
|---|-----|
| 2 | 128 |
| 2 | 64 |
| 2 | 32 |
| 2 | 16 |
| 2 | 8 |
| 2 | 4 |
| 2 | 2 |
| | 1 |

Prime factors of $128 = 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2$

Here one factor 2 does not appear in a 3's group. Therefore, 128 must be divided by 2 to make it a perfect cube.

- (iii) 135

| | |
|---|-----|
| 3 | 135 |
| 3 | 45 |
| 3 | 15 |
| 5 | 5 |
| | 1 |

Prime factors of $135 = 3 \times 3 \times 3 \times 5$

Here one factor 5 does not appear in a triplet.

Therefore, 135 must be divided by 5 to make it a perfect cube.

- (iv) 192

| | |
|---|-----|
| 2 | 192 |
| 2 | 96 |
| 2 | 48 |
| 2 | 24 |
| 2 | 12 |
| 2 | 6 |
| 3 | 3 |
| | 1 |

Prime factors of 192 = 2X2X2X2X2X2X3
 Here one factor 3 does not appear in a triplet.
 Therefore, 192 must be divided by 3 to make it a perfect cube.
 (v) 704

| | |
|----|-----|
| 2 | 704 |
| 2 | 352 |
| 2 | 176 |
| 2 | 88 |
| 2 | 44 |
| 2 | 22 |
| 11 | 11 |
| | 1 |

Prime factors of 704 = 2X2X2X2X2X2X11
 Here one factor 11 does not appear in a triplet.
 Therefore, 704 must be divided by 11 to make it a perfect cube.
Ex 6.1 Question 4.

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?
Answer.

Given numbers = 5 × 2 × 5
 Since, Factors of 5 and 2 both are not in group of three.
 Therefore, the number must be multiplied by 2 × 5 × 2 = 20 to make it a perfect cube. Hence he needs 20 cuboids.

Exercise 6.2 (Revised) - Chapter 7 - Cube & Cube Roots - Ncert Solutions class 8 - Maths

Updated On 11-02-2025 By Lithanya

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Ex 6.2 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.

- (i) 64

| | |
|---|----|
| 2 | 64 |
| 2 | 32 |
| 2 | 16 |
| 2 | 8 |
| 2 | 4 |
| 2 | 2 |
| | 1 |

$$\sqrt[3]{64} = \sqrt[3]{2 \times 2 \times 2 \times 2 \times 2 \times 2}$$
$$\sqrt[3]{64} = 2 \times 2 = 4$$

- (ii) 512

| | |
|---|-----|
| 2 | 512 |
| 2 | 256 |
| 2 | 128 |
| 2 | 64 |
| 2 | 32 |
| 2 | 16 |
| 2 | 8 |
| 2 | 4 |
| 2 | 2 |
| | 1 |

$\sqrt[3]{512} = \sqrt[3]{2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2}$
 $= 2 \times 2 \times 2 = 8$

(iii) 10648

| | |
|-----------|--------------|
| 2 | 10648 |
| 2 | 5324 |
| 2 | 2662 |
| 11 | 1331 |
| 11 | 121 |
| 11 | 11 |
| | 1 |

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

(iv) 27000

| | |
|----------|--------------|
| 2 | 27000 |
| 2 | 13500 |
| 2 | 6750 |
| 3 | 3375 |
| 3 | 1125 |
| 3 | 375 |
| 5 | 125 |
| 5 | 25 |
| 5 | 5 |
| | 1 |

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

(v) 15625

| | |
|----------|--------------|
| 5 | 15625 |
| 5 | 3125 |
| 5 | 625 |
| 5 | 125 |
| 5 | 25 |
| 5 | 5 |
| | 1 |

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

(vi) 13824

| | |
|----------|--------------|
| 2 | 13824 |
| 2 | 6912 |
| 2 | 3456 |
| 2 | 1728 |
| 2 | 864 |
| 2 | 432 |
| 2 | 216 |
| 2 | 108 |
| 2 | 54 |
| 3 | 27 |
| 3 | 9 |
| 3 | 3 |
| | 1 |

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

(vii) 110592

| | |
|---|--------|
| 2 | 110592 |
| 2 | 55296 |
| 2 | 27648 |
| 2 | 13824 |
| 2 | 6912 |
| 2 | 3456 |
| 2 | 1728 |
| 2 | 864 |
| 2 | 432 |
| 2 | 216 |
| 2 | 108 |
| 2 | 54 |
| 3 | 27 |
| 3 | 9 |
| 3 | 3 |
| | 1 |

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

$$= 2 \times 2 \times 2 \times 2 \times 3 = 48$$

(viii) 46656

| | |
|---|-------|
| 2 | 46656 |
| 2 | 23328 |
| 2 | 11664 |
| 2 | 5832 |
| 2 | 2916 |
| 2 | 1458 |
| 3 | 729 |
| 3 | 243 |
| 3 | 81 |
| 3 | 27 |
| 3 | 9 |
| 3 | 3 |
| | 1 |

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

$$= 2 \times 2 \times 3 \times 3 = 36$$

(ix) 175616

| | |
|---|--------|
| 2 | 175616 |
| 2 | 87808 |
| 2 | 43904 |
| 2 | 21952 |
| 2 | 10976 |
| 2 | 5488 |
| 2 | 2744 |
| 2 | 1372 |
| 2 | 686 |
| 7 | 343 |
| 7 | 49 |
| 7 | 7 |
| | 1 |

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

$$= 2 \times 2 \times 2 \times 7 = 56$$

(x) 91125

| | |
|---|-------|
| 3 | 91125 |
| 3 | 30375 |
| 3 | 10125 |
| 3 | 3375 |
| 3 | 1125 |
| 3 | 375 |
| 5 | 125 |
| 5 | 25 |
| 5 | 5 |
| | 1 |

Ex 6.2 Question 2.

State true or false:

- (i) Cube of any odd number is even.
- (ii) A perfect cube does not end with two zeroes.
- (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) False

Since, $1^3 = 1, 3^3 = 27, 5^3 = 125, \dots$ are all odd.

(ii) True

Since, a perfect cube ends with three zeroes.

e.g. $10^3 = 1000, 20^3 = 8000, 30^3 = 27000, \dots$ so on

(iii) False

Since, $5^2 = 25, 5^3 = 125, 15^2 = 225, 15^3 = 3375$

(Did not end with 25)

(iv) False

Since $12^3 = 1728$

[Ends with 8]

And $22^3 = 10648$

[Ends with 8]

(v) False Since $10^3 = 1000$

[Four digit number]

And $11^3 = 1331$

[Four digit number]

(vi) False Since $99^3 = 970299$

[Six digit number]

(vii) True

$1^3 = 1$

[Single digit number]

$2^3 = 8$

[Single digit number]