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

Updated On 11-02-2025 By Lithanya

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 $1000 = 2X2X2X5X5X5$
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 $5\ \text{cm}, 2\ \text{cm}, 5\ \text{cm}$. How many such cuboids will he need to form a cube?

Answer.

Given numbers $= 5 \times 2 \times 5$

Since, Factors of 5 and 2 both are not in group of three.

Therefore, the number must be multiplied by $2 \times 5 \times 2 = 20$ 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

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

(ii) True

Since, a perfect cube ends with three zeroes.

e.g. $10^3 = 1000, 20^3 = 8000, 30^3 = 27000, \ldots$ 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]