SpeedLabs

MATHS

CBSE 8th

TEEVRA EDUTECH PVT. LTD.

Cube and Cuboid root
Exercise 7.2

SpeedLabs
Assisted Practice | Expert Guidance | Personalized Insights
"An Innovative Practice Methodology by IITians."

Q.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

Sol:

(i) 64

Prime factors of $64 = 2 \times 2 \times 2 \times 2 \times 2 \times 2$

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

2	64
2	32
2	16
2	8
2	4
2	2
	1

(ii) 512

Prime factors of $512 = 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2$

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

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

(iii) 10648

Prime factors of $10648 = 2 \times 2 \times 2 \times 11 \times 11 \times 11$

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

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

(iv) 27000

Prime factors of $27000 = 2 \times 2 \times 2 \times 3 \times 3 \times 3 \times 5 \times 5 \times 5$

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

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

(v) 15625

Prime factors of $15625 = 5 \times 5 \times 5 \times 5 \times 5 \times 5$

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

$= 25$

5	15625
5	3125
5	625
5	125
5	25
5	5
	1

(vi) 13824

Prime factors of $13824 = 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 3 \times 3 \times 3$

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

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

(vii) 110592

Prime factors of $110592 = 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 3 \times 3 \times 3$

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

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

(viii) 46656

Prime factors of $46656 = 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 3 \times 3 \times 3 \times 3 \times 3 \times 3$

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

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

(ix) 175616

Prime factors of $175616 = 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 7 \times 7 \times 7$

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

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

(x) 91125

Prime factors of $91125 = 3 \times 3 \times 3 \times 3 \times 3 \times 3 \times 5 \times 5 \times 5$

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

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

Q.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 single digit number.

Sol:

(i)False

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

(ii)True

Since, a perfect cube ends with three zeros.

For example, $1000 = 10^3, 8000 = 20^3, 27000 = 30^3$,…..,

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)

$22^3 = 10648$ (Ends with 8)

(v) False

Since, $10^3 = 1000$ (Four digit number)

$11^3 = 1331$ (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)

Q.3 You are told that 1,331is a perfect cube, Can you guess without factorization what is its cube root?

Similarly, guess the cube roots of 4913, 12167, 32768.

Sol:

We know that $10^3 = 1000$.

Possible cube of $11^3 = 1331$.

Since, cube of unit's digit $1^3 = 1$.

So, cube root of 1331 is 11.

4913

We know that $7^3 = 343$

Next number comes $17^3 = 4913$

Hence, cube root of 4913 is 17.

12167

We know that $3^3 = 27$

One's digit is 7.

Now, next number comes $13^3 = 2197$

Now, next number comes $23^3 = 12167$

Hence, cube root of 12167 is 23.

32768

We know that 2

3 = 8 which is unit digit.

Now, comes $12^3 = 1728$.

Now, next comes $22^3 = 10648$.

Now, next number comes $32^3 = 32768$.

Hence, cube root of 32768 is 32.