Class –VIII Mathematics (Ex. 7.1)

Answers

1. (i) 216

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

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

(ii) 128

Prime factors of 128 = 2 x 2 x 2 x 2 x 2 x 2 x 2
Here one factor 2 does not appear in a 3's group.
Therefore, 128 is not a perfect cube.

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

(iii) 1000

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

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

(iv) 100

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

2	100
2	50
5	25
5	5
	1

(v) 46656

Prime factors of 46656 = 2 x 2 x 2 x 2 x 2 x 2 x 3 x 3 x 3 x 3 x 3 x 3

Here all factors appear in 3's group.

Therefore, 46656 is a perfect cube.

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

2. (i) 243

Prime factors of 243 = 3 x 3 x 3 x 3 x 3

Here 3 does not appear in 3's group.

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

3	243
3	81
3	27
3	9
3	3
	1

(ii) 256

Prime factors of 256 = 2 x 2 x 2 x 2 x 2 x 2 x 2 x 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.

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

(iii) 72

Prime factors of 72 = 2 x 2 x 2 x 3 x 3

Here 3 does not appear in 3's group.

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

2	72
2	36
2	18
3	9
3	3
	1

(iv) 675

Prime factors of 675 = 3 x 3 x 3 x 5 x 5
Here factor 5 does not appear in 3's group.
Therefore 675 must be multiplied by 3 to make it a perfect cube.

3	675
3	225
3	75
5	25
5	5
	1

(v) 100

Prime factors of 100 = 2 x 2 x 5 x 5
Here factor 2 and 5 both do not appear in 3's group.
Therefore 100 must be multiplied by 2 x 5 = 10 to make it a perfect cube.

2	100
2	50
5	25
5	5
	1

3. (i) 81

Prime factors of 81 = 3 x 3 x 3 x 3
Here one factor 3 is not grouped in triplets.
Therefore 81 must be divided by 3 to make it a perfect cube.

3	81
3	27
3	9
3	3
	1

(ii) 128

Prime factors of 128 = 2 x 2 x 2 x 2 x 2 x 2 x 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.

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

(iii) 135

Prime factors of 135 = 3 x 3 x 3 x 5
Here one factor 5 does not appear in a triplet.
Therefore, 135 must be divided by 5 to make it a perfect cube.

3	135
3	45
3	15
5	5
	1

(iv) 192

Prime factors of 192 = 2 x 2 x 2 x 2 x 2 x 2 x 3

Here one factor 3 does not appear in a triplet.

Therefore, 192 must be divided by 3 to make it a perfect cube.

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

(v) 704

Prime factors of 704 = 2 x 2 x 2 x 2 x 2 x 2 x 11

Here one factor 11 does not appear in a triplet.

Therefore, 704 must be divided by 11 to make it a perfect cube.

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

4. Given numbers = 5 x 2 x 5

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

Therefore, the number must be multiplied by 2 x 2 x 5 = 20 to make it a perfect cube.

Hence he needs 20 cuboids.

Class –VIII Mathematics (Ex. 7.2)

Answers

1. (i) 64

$\sqrt[3]{64} = \sqrt[3]{2\times2\times2\times2\times2\times2}$

$\sqrt[3]{64}$ = 2 x 2

= 4

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

(ii) 512

$\sqrt[3]{512} = \sqrt[3]{2\times2\times2\times2\times2\times2\times2\times2\times2}$

= 2 x 2 x 2

= 8

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

(iii) 10648

$\sqrt[3]{10648} = \sqrt[3]{2\times2\times2\times11\times11\times11}$

= 2 x 11

= 22

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

(iv) 27000

$\sqrt[3]{27000} = \sqrt[3]{2\times2\times2\times3\times3\times3\times5\times5\times5}$

= 2 x 3 x 5

= 30

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

(v) 15625

$\sqrt[3]{15625} = \sqrt[3]{5\times5\times5\times5\times5\times5}$

= 5 x 5

= 25

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

(vi) 13824

$\sqrt[3]{13824} = \sqrt[3]{2\times2\times2\times2\times2\times2\times2\times2\times2\times3\times3\times3}$

= 2 x 2 x 2 x 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

$\sqrt[3]{110592} = \sqrt[3]{2\times2\times2\times2\times2\times2\times2\times2\times2\times2\times2\times2\times3\times3\times3}$

= 2 x 2 x 2 x 2 x 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

$\sqrt[3]{46656} = \sqrt[3]{2\times2\times2\times2\times2\times2\times3\times3\times3\times3\times3\times3}$

= 2 x 2 x 3 x 3

= 36

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

(ix) 175616

$\sqrt[3]{175616} = \sqrt[3]{2\times2\times2\times2\times2\times2\times2\times2\times2\times7\times7\times7}$

= 2 x 2 x 2 x 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

$\sqrt[3]{91125} = \sqrt[3]{3\times3\times3\times3\times3\times3\times5\times5\times5}$

= 3 x 3 x 5

= 45

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

2. (i) False

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

(ii) True

Since, a perfect cube ends with three zeroes.

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

3. We know that $10^3 = 1000$ and Possible cube of $11^3 = 1331$

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

Therefore, cube root of 1331 is 11.

4913

We know that $7^3 = 343$

Next number comes with 7 as unit place $17^3 = 4913$

Hence, cube root of 4913 is 17.

12167

We know that $3^3 = 27$

Here in cube, ones digit is 7

Now next number with 3 as ones digit $13^3 = 2197$

And next number with 3 as ones digit $23^3 = 12167$

Hence cube root of 12167 is 23.

32768

We know that $2^3 = 8$

Here in cube, ones digit is 8

Now next number with 2 as ones digit $12^3 = 1728$

And next number with 2 as ones digit $22^3 = 10648$

And next number with 2 as ones digit $32^3 = 32768$

Hence cube root of 32768 is 32.