CBSE Class –VIII Mathematics

NCERT Solutions

CHAPTER - 7

Cubes and Cube Roots (Ex. 7.1)

1. Which of the following numbers are not perfect cubes:

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

Ans. (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 x 2 x 5 x 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.

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

Ans. (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 2×5 = 10 to make it a perfect cube.

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

Ans. (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 = $2 \times 2 \times 2 \times 2 \times 2 \times 2$ 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.

(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.

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?

Ans. 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.