

## Exercise 7.2

### 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 1:

(i) 64

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

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

(ii) 512

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

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

(iii) 10648

$$\begin{aligned}\sqrt[3]{10648} &= \sqrt[3]{2 \times 2 \times 2 \times 11 \times 11 \times 11} \\ &= 2 \times 11 \\ &= 22\end{aligned}$$

<b>2</b>	<b>10648</b>
2	5324
2	2662
<b>11</b>	<b>1331</b>
11	121
11	11
	1

(iv) 27000

$$\begin{aligned}\sqrt[3]{27000} &= \sqrt[3]{2 \times 2 \times 2 \times 3 \times 3 \times 3 \times 5 \times 5 \times 5} \\ &= 2 \times 3 \times 5 \\ &= 30\end{aligned}$$

<b>2</b>	<b>27000</b>
2	13500
2	6750
<b>3</b>	<b>3375</b>
3	1125
3	375
<b>5</b>	<b>125</b>
5	25
5	5
	1

(v) 15625

$$\begin{aligned}\sqrt[3]{15625} &= \sqrt[3]{5 \times 5 \times 5 \times 5 \times 5 \times 5} \\ &= 5 \times 5 \\ &= 25\end{aligned}$$

<b>5</b>	<b>15625</b>
5	3125
5	625
5	125
5	25
5	5
	1

(vi) 13824

$$\begin{aligned}\sqrt[3]{13824} &= \sqrt[3]{2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 3 \times 3 \times 3} \\ &= 2 \times 2 \times 2 \times 3 \\ &= 24\end{aligned}$$

<b>2</b>	<b>13824</b>
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

$$\begin{aligned}\sqrt[3]{110592} &= \sqrt[3]{2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 3 \times 3 \times 3} \\ &= 2 \times 2 \times 2 \times 2 \times 3 \\ &= 48\end{aligned}$$

<b>2</b>	<b>110592</b>
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

$$\begin{aligned}\sqrt[3]{46656} &= \sqrt[3]{2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 3 \times 3 \times 3 \times 3 \times 3 \times 3} \\ &= 2 \times 2 \times 3 \times 3 \\ &= 36\end{aligned}$$

2	<b>46656</b>
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

$$\begin{aligned}\sqrt[3]{175616} &= \sqrt[3]{2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 7 \times 7 \times 7} \\ &= 2 \times 2 \times 2 \times 7 \\ &= 56\end{aligned}$$

2	<b>175616</b>
2	87808
2	43904
2	21952
2	10976

2	5488
2	2744
2	1372
2	686
7	343
7	49
7	7
	1

(x)  $\sqrt[3]{91125}$

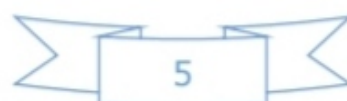
$$\begin{aligned} \sqrt[3]{91125} &= \sqrt[3]{3 \times 3 \times 3 \times 3 \times 3 \times 5 \times 5 \times 5} \\ &= 3 \times 3 \times 5 \\ &= 45 \end{aligned}$$

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

## 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 2:

- (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]

### Question 3:

You are told that 1,331 is a perfect cube. Can you guess with factorization what is its cube root? Similarly guess the cube roots of 4913, 12167, 32768.

### Answer 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.

