

Practice Set 3.1 8th Std Maths Answers Chapter 3 Indices and Cube Root

Question 1.

Express the following numbers in index form.

- i. Fifth root of 13
- ii. Sixth root of 9
- iii. Square root of 256
- iv. Cube root of 17
- v. Eighth root of 100
- vi. Seventh root of 30

Solution:

i. $(13)_{15}$

ii. $(9)_{16}$

iii. $(256)_{12}$

iv. $(17)_{13}$

v. $(100)_{18}$

vi. $(30)_{17}$

Question 2.

Write in the form 'nth root of a' in each of the following numbers.

i. $(81)_{14}$

ii. $(49)_{12}$

iii. $(15)_{15}$

iv. $(512)_{19}$

v. $(100)_{119}$

vi. $(6)_{17}$

Solution:

- i. Fourth root of 81.
- ii. Square root of 49.
- iii. Fifth root of 15.
- iv. Ninth root of 512.
- v. Nineteenth root of 100.
- vi. Seventh root of 6.

Maharashtra Board Class 8 Maths Chapter 3 Indices and Cube Root Practice Set 3.1 Intext Questions and Activities

Question 1.

Using laws of indices, write proper numbers in the following boxes. (Textbook pg, no. 14)

i. $35 \times 32 = 3()$

ii. $37 \div 39 = 3()$

iii. $(34)5 = 3()$

iv. $5-3 = 15()$

v. $50 = ()$

vi. $51 = ()$

vii. $(5 \times 7)2 = 5() \times 7()$

viii. $(57)3 = ()3()3$

ix. $(57)-3 = (())3$

Solution:

i. $35 \times 32 = 37$

ii. $37 \div 39 = 3-2$

iii. $(34)5 = 320$

iv. $5-3 = 153$

v. $50 = 1$

vi. $51 = 5$

vii. $(5 \times 7)2 = 52 \times 72$

viii. $(57)3 = 5373$

ix. $(57)-3 = (75)3$

Practice Set 3.2 8th Std Maths Answers Chapter 3 Indices and Cube Root

Question 1.

Complete the following table.

S.No.	Number	Power of the root	Root of the power
1.	$(225)^{32}$	Cube of square root of 225	Square root of cube of 225
2.	$(45)^{45}$		

3.	$(81)_{67}$		
4.	$(100)_{410}$		
5.	$(21)_{37}$		

Solution:

S.No.	Number	Power of the root	Root of the power
1.	$(225)_{32}$	Cube of square root of 225	Square root of cube of 225
2.	$(45)_{45}$	4th power of 5th root of 45	5th root of 4th power of 45
3.	$(81)_{67}$	6th power of 7th root of 81	7th root of 6th power of 81
4.	$(100)_{410}$	4th power of 10th root of 100	10th root of 4th power of 100
5.	$(21)_{37}$	Cube of 7th root of 21	7th root of cube of 21

Question 2.

Write the following numbers in the form of rational indices.

i. Square root of 5th power of 121.

ii. Cube of 4th root of 324.

iii. 5th root of square of 264.

iv. Cube of cube root of 3.

Solution:

i. $(121)_{52}$

ii. $(324)_{34}$

iii. $(264)_{25}$

iv. $(3)_{33}$

Practice Set 3.3 8th Std Maths Answers Chapter 3 Indices and Cube Root

Question 1.

Find the cube root of the following numbers.

i. 8000

ii. 729

iii. 343

iv. -512

v. -2744

vi. 32768

Solution:

i. 8000

$$= 2 \times 2 \times 2 \times 10 \times 10 \times 10$$

$$= (2 \times 10) \times (2 \times 10) \times (2 \times 10)$$

$$= (2 \times 10)^3$$

$$= 20^3$$

$$\therefore 8000 \text{ --- } \sqrt[3]{} = 20$$

2	8000
2	4000
2	2000
10	1000
10	100
10	10
	1

ii. 729

$$= (3 \times 3) \times (3 \times 3) \times (3 \times 3)$$

$$= (3 \times 3)^3$$

$$= 9^3$$

$$\therefore 729 \text{ --- } \sqrt[3]{} = 9$$

3	729
3	243
3	81
3	27
3	9
3	3
	1

iii. 343

$$= 7 \times 7 \times 7$$

$$= 7^3$$

$$\therefore 343 \text{---} \sqrt[3]{343} = 7$$

7	343
7	49
7	7
	1

iv. -512

$$= 2 \times 2 \times 2 \times 4 \times 4 \times 4$$

$$= (2 \times 4) \times (2 \times 4) \times (2 \times 4)$$

$$= (2 \times 4)^3$$

$$= 8^3$$

$$\therefore -512 = (-8) \times (-8) \times (-8)$$

$$= (-8)^3$$

$$\therefore -512 \text{----} \sqrt[3]{-512} = -8$$

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

v. -2744

$$= 2 \times 2 \times 2 \times 7 \times 7 \times 7$$

$$= (2 \times 7) \times (2 \times 7) \times (2 \times 7)$$

$$= (2 \times 7)^3$$

$$= 14^3$$

$$\therefore -2744 = (-14) \times (-14) \times (-14)$$

$$= (-14)^3$$

$$\therefore -2744 \text{-----} \sqrt[3]{-2744} = -14$$

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

vi. 32768

$$\begin{aligned}
 &= 2 \times 2 \times 2 \times 4 \times 4 \times 4 \times 4 \times 4 \times 4 \\
 &= (2 \times 4 \times 4) \times (2 \times 4 \times 4) \times (2 \times 4 \times 4) \\
 &= (2 \times 4 \times 4)^3 \\
 &= 32^3
 \end{aligned}$$

$$\therefore 32768 \text{-----} \sqrt[3]{} = 32$$

2	32768
2	16384
2	8192
4	4096
4	1024
4	256
4	64
4	16
4	4
	1

Question 2.

Simplify:

i. $27125 \text{---} \sqrt[3]{}$

ii. $1654 \text{--} \sqrt[3]{}$

iii. If $729 \text{---} \sqrt[3]{} = 9$ then $0.000729 \text{-----} \sqrt[3]{} = ?$

Solution:

i. $27125 \text{---} \sqrt[3]{}$

$$\sqrt[3]{\frac{27}{125}} = \frac{\sqrt[3]{27}}{\sqrt[3]{125}} \quad \dots \left[\left(\frac{a}{b} \right)^m = \frac{a^m}{b^m} \right]$$

$$= \frac{\sqrt[3]{3 \times 3 \times 3}}{\sqrt[3]{5 \times 5 \times 5}}$$

$$= \frac{\sqrt[3]{3^3}}{\sqrt[3]{5^3}}$$

$$= \frac{(3^3)^{\frac{1}{3}}}{(5^3)^{\frac{1}{3}}}$$

$$\therefore \sqrt[3]{\frac{27}{125}} = \frac{3}{5} \quad \dots \left[(a^m)^{\frac{1}{m}} = a \right]$$

ii. $1654 \rightarrow \sqrt[3]{}$

$$\begin{aligned}
 \sqrt[3]{\frac{16}{54}} &= \sqrt[3]{\frac{8 \times 2}{27 \times 2}} \\
 &= \sqrt[3]{\frac{8}{27}} \\
 &= \frac{\sqrt[3]{8}}{\sqrt[3]{27}} \quad \dots \left[\left(\frac{a}{b} \right)^m = \frac{a^m}{b^m} \right] \\
 &= \frac{\sqrt[3]{2 \times 2 \times 2}}{\sqrt[3]{3 \times 3 \times 3}} \\
 &= \frac{\sqrt[3]{2^3}}{\sqrt[3]{3^3}} \\
 &= \frac{(2^3)^{\frac{1}{3}}}{(3^3)^{\frac{1}{3}}} \\
 \therefore \sqrt[3]{\frac{16}{54}} &= \frac{2}{3} \quad \dots \left[(a^m)^{\frac{1}{m}} = a \right]
 \end{aligned}$$

iii. $0.000729 \rightarrow \sqrt[3]{}$

$$\begin{aligned}
 \sqrt[3]{0.000729} &= \sqrt[3]{\frac{729}{1000000}} \\
 &= \frac{\sqrt[3]{729}}{\sqrt[3]{1000000}} \quad \dots \left[\left(\frac{a}{b} \right)^m = \frac{a^m}{b^m} \right] \\
 &= \frac{9}{\sqrt[3]{100^3}} \quad \dots \left[\sqrt[3]{729} = 9 \right] \\
 &= \frac{9}{(100^3)^{\frac{1}{3}}} \\
 &= \frac{9}{100} \quad \dots \left[(a^m)^{\frac{1}{m}} = a \right] \\
 \therefore \sqrt[3]{0.000729} &= \mathbf{0.09}
 \end{aligned}$$

Note:

Here, number of decimal places in cube root = 6

 \therefore number of decimal places in cube of number = 2

Maharashtra Board Class 8 Maths Chapter 3 Indices and Cube Root Practice Set 3.3 Intext Questions and Activities

Question 1.

17 is a positive number. The cube of 17, which is 4913, is also a positive number. Cube of -6 is -216. Take some more positive and negative numbers and obtain their cubes. Find the relation between the sign of a number and the sign of its cube. (Textbook pg. no. 17)

Solution:

Consider, $6^3 = 6 \times 6 \times 6 = 216$ and $(-4)^3 = (-4) \times (-4) \times (-4) = -64$

Thus, cube of a positive number is positive and cube of a negative number is negative.

\therefore Sign of a number = sign of its cube.

Question 2.

In example 4 and 5 on textbook pg. no. 17, observe the number of decimal places in the number and number of decimal places in the cube of the number. Is there any relation between the two? (Textbook pg. no. 17)

Solution:

Yes, there is a relation between the number of decimal places in the number and its cube.

$(1.2)^3 = 1.728$, $(0.02)^3 = 0.000008$

No. of decimal places in 1.2 = 1

No. of decimal places in 1.728 = 3

No. of decimal places in 0.02 = 2

No. of decimal places in 0.000008 = 6

Thus, number of decimal places in cube of a number is three times the number of decimal places in that number.