Maharashtra Board Solutions Class 8-Maths (Practice Set 3.3): Chapter 3- Indices and Cube Root

For any clarifications or questions you can write to **info@indcareer.com**

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Maharashtra Board Solutions Class 8-Maths (Practice Set 3.3): Chapter 3- Indices and Cube Root

Class 8: Maths Chapter 3 solutions. Complete Class 8 Maths Chapter 3 Notes.

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Maharashtra Board 8th Maths Chapter 3, Class 8 Maths Chapter 3 solutions

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 × 2 × 2 × 10 × 10 × 10

= (2 × 10) × (2 × 10) × (2 × 10)

= $(2 \times 10)^3$

= 20^3

∴ 8000−−−−√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

∴ 729−−−√3=9

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

iii. 343

= $7 \times 7 \times 7$

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= 7^3

∴ $343---\sqrt{3}=7$

7	343
7	49
7	7
	1

iv. -512

= 2 × 2 × 2 × 4 × 4 × 4

= (2 × 4) × (2 × 4) × (2 × 4)

= $(2 \times 4)^3$

= 8^3

∴ – 512 = (- 8) × (- 8) × (- 8)

= $(-8)^3$

∴ $-512----\sqrt{3}=-8$

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

v. -2744

= 2 × 2 × 2 × 7 × 7 × 7

= (2 × 7) × (2 × 7) × (2 × 7)

= (2 × 7)³

= 14³

∴ -2744 = (-14) × (-14) × (-14)

= (-14)³

∴ −2744−−−−−√3=−14

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

vi. 32768

= 2 × 2 × 2 × 4 × 4 × 4 × 4 × 4 × 4

= (2 × 4 × 4) × (2 × 4 × 4) × (2 × 4 × 4)

= (2 × 4 × 4)³

= 32³

∴ 32768−−−−−√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. $\sqrt[3]{27125}$

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

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

Solution:

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

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

$$= \frac{\sqrt[3]{3\times3\times3}}{\sqrt[3]{5\times5\times5}}$$

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

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

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

ii. 1654−−√3

$$\sqrt[3]{\frac{16}{54}} = \sqrt[3]{\frac{8\times 2}{27\times 2}}$$

$$= \sqrt[3]{\frac{8}{27}}$$

$$= \frac{\sqrt[3]{8}}{\sqrt[3]{27}} \qquad \ldots\left[\left(\frac{a}{b}\right)^m = \frac{a^m}{b^m}\right]$$

$$= \frac{\sqrt[3]{2\times 2\times 2}}{\sqrt[3]{3\times 3\times 3}}$$

$$= \frac{\sqrt[3]{2^3}}{\sqrt[3]{3^3}}$$

$$= \frac{(2^3)^{\frac{1}{3}}}{(3^3)^{\frac{1}{3}}}$$

$$\therefore \quad \sqrt[3]{\frac{16}{54}} = \frac{2}{3} \qquad \ldots\left[(a^m)^{\frac{1}{m}} = a\right]$$

iii. 0.000729−−−−−−−√3

$$\sqrt[3]{0.000729} = \sqrt[3]{\frac{729}{1000000}}$$

$$= \frac{\sqrt[3]{729}}{\sqrt[3]{1000000}} \qquad \ldots\left[\left(\frac{a}{b}\right)^m = \frac{a^m}{b^m}\right]$$

$$= \frac{9}{\sqrt[3]{100^3}} \qquad \ldots\left[\sqrt[3]{729} = 9\right]$$

$$= \frac{9}{(100^3)^{\frac{1}{3}}}$$

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$$= \frac{9}{100} \qquad \ldots\left[\left(a^m\right)^{\frac{1}{m}} = a\right]$$

$$\therefore \quad \sqrt[3]{0.000729} = \mathbf{0.09}$$

Note:

Here, number of decimal places in cube root = 6

∴ number of decimal places in cube of number = 2

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.

∴ 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.

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- Chapter 9- Discount and Commission (Practice Set 9.2)
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- Chapter 16- Surface Area and Volume (Practice Set 16.2)
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- Chapter 17- Factorisation of Algebraic Expressions (Practice Set 17.1)
- Chapter 17- Factorisation of Algebraic Expressions (Practice Set 17.2)

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FAQs

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