

Maths Assignment 12, Std VIII

* Cube root of product of integers:

$$\sqrt[3]{ab} = \sqrt[3]{a} \times \sqrt[3]{b}$$

Example 1: Evaluate: $\sqrt[3]{(-1331) \times (3375)}$

$$\begin{array}{r|l} 11 & 1331 \\ 11 & 121 \\ 11 & 11 \\ & 1 \end{array}$$

$$\begin{array}{r|l} 3 & 3375 \\ 3 & 1125 \\ 3 & 375 \\ 5 & 125 \\ 5 & 25 \\ 5 & 5 \\ & 1 \end{array}$$

$$1331 = 11^3$$

$$\sqrt[3]{1331} = 11$$

$$3375 = 3^3 \times 5^3$$

$$\begin{aligned} \sqrt[3]{3375} &= 3 \times 5 \\ &= 15 \end{aligned}$$

$$\begin{aligned} \sqrt[3]{(-1331) \times (3375)} &= \sqrt[3]{(-1331)} \times \sqrt[3]{3375} \\ &= -\sqrt[3]{1331} \times 15 \\ &= -11 \times 15 \\ &= -165 \text{ Ans} \end{aligned}$$

* Cube root of a rational number:

$$\sqrt[3]{\frac{a}{b}} = \frac{\sqrt[3]{a}}{\sqrt[3]{b}}$$

Q-2 Evaluate $\sqrt[3]{9.261}$

$$\sqrt[3]{9.261} = \sqrt[3]{\frac{9261}{1000}} = \frac{\sqrt[3]{9261}}{\sqrt[3]{1000}}$$

$$\begin{array}{r|l} 3 & 9261 \\ \hline 3 & 3087 \\ \hline 3 & 1029 \\ \hline 7 & 343 \\ \hline 7 & 49 \\ \hline 7 & 7 \\ \hline & 1 \end{array}$$

$$9261 = 3^3 \times 7^3$$

$$\sqrt[3]{9261} = 3 \times 7 = 21$$

$$1000 = 10 \times 10 \times 10$$

$$\sqrt[3]{1000} = 10$$

$$\sqrt[3]{9.261} = \frac{\sqrt[3]{9261}}{\sqrt[3]{1000}} = \frac{21}{10} = 2.1 \quad \underline{\text{Ans}}$$

Q-3 By what smallest number should 55125 be multiplied so that the product becomes a perfect cube? Also find the cube root of the product.

$$\begin{array}{r|l} 3 & 55125 \\ \hline 3 & 18375 \\ \hline 5 & 6125 \\ \hline 5 & 1225 \\ \hline 5 & 245 \\ \hline 7 & 49 \\ \hline 7 & 7 \\ \hline & 1 \end{array}$$

$$55125 = 3 \times 3 \times (5 \times 5 \times 5) \times 7 \times 7$$

The smallest number by which the given number must be multiplied so that the product is a perfect cube is $3 \times 7 = 21$

Ans

$$\text{Product} = 55125 \times 3 \times 7$$

$$1157625 = 3^2 \times 5^3 \times 3 \times 7$$

$$\sqrt[3]{1157625} = 3 \times 5 \times 7 = 105 \quad \underline{\text{Ans}}$$

Q-4. Divide 259875 by the smallest number so that the quotient is a perfect cube. Also find the cube root of the quotient.

$$\begin{array}{r|l}
 3 & 259875 \\
 3 & 86625 \\
 3 & 28875 \\
 5 & 9625 \\
 5 & 1925 \\
 5 & 385 \\
 7 & 77 \\
 11 & 11 \\
 & 1
 \end{array}$$

$$259875 = (3 \times 3 \times 3) \times (5 \times 5 \times 5) \times 7 \times 11$$

The smallest number by which 259875 must be divided so that the quotient is a perfect cube is 7×11 i.e. 77 Ans

$$\begin{aligned} \text{quotient} &= 259875 \div 77 \\ &= 3375 \end{aligned}$$

$$3375 = 3^3 \times 5^3$$

$$\begin{aligned} \sqrt[3]{3375} &= 3 \times 5 \\ &= 15 \quad \underline{\text{Ans}} \end{aligned}$$

Worksheet - 12

Q-1 Evaluate: (i) $\sqrt[3]{512 \times 729}$

(ii) $\sqrt[3]{125 \times (-64)}$

(iii) $\sqrt[3]{0.216}$

(iv) $\sqrt[3]{0.3375}$

Q-2 Multiply 6561 by the smallest number so that the product is a perfect cube. Also find the cube root of the product.

Q-3 Divide the number 8748 by the smallest number so that the quotient is a perfect cube. Also find the cube root of the quotient.