Cubes and Cubes Roots Ex 4.4 Q10

Answer :

Volume of a cube is given by:
$V = s^3$, where s = side of the cube

Now
$$s^3 = 474.552 \; cubic \; metres$$
$$\Rightarrow s = \sqrt[3]{474.552} = \sqrt[3]{\frac{474552}{1000}} = \frac{\sqrt[3]{474552}}{\sqrt[3]{1000}}$$

To find the cube root of 474552, we need to proceed as follows:

On factorising 474552 into prime factors, we get:
$$474552 = 2 \times 2 \times 2 \times 3 \times 3 \times 3 \times 13 \times 13 \times 13$$

On grouping the factors in triples of equal factors, we get:
$$474552 = \{2 \times 2 \times 2\} \times \{3 \times 3 \times 3\} \times \{13 \times 13 \times 13\}$$

Now, taking one factor from each triple, we get:

$$\sqrt[3]{474552} = \sqrt[3]{\{2 \times 2 \times 2\} \times \{3 \times 3 \times 3\} \times \{13 \times 13 \times 13\}} = 2 \times 3 \times 13 = 78$$

Also

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

$$\therefore s = \frac{\sqrt[3]{474552}}{\sqrt[3]{1000}} = \frac{78}{10} = 7.8$$

Thus, the length of the side is 7.8 m.

Cubes and Cubes Roots Ex 4.4 Q11

Answer:

Let the numbers be 2x, 3x and 4x.

According to the question:

$$(2x)^3 + (3x)^3 + (4x)^3 = 0.334125$$
$$\Rightarrow 8x^3 + 27x^3 + 64x^3 = 0.334125$$
$$\Rightarrow 8x^3 + 27x^3 + 64x^3 = 0.334125$$
$$\Rightarrow 99x^3 = 0.334125$$
$$\Rightarrow x^3 = \frac{\cancel{334125}^{\,3375}}{1000000 \times \cancel{99}}$$
$$\Rightarrow x = \sqrt[3]{\frac{3375}{1000000}}$$
$$\Rightarrow x = \frac{\sqrt[3]{3375}}{\sqrt[3]{1000000}}$$
$$\Rightarrow x = \frac{15}{100} = 0.15.$$

Thus, the numbers are:

$$2 \times 0.15 = 0.30$$
$$3 \times 0.15 = 0.45$$
$$4 \times 0.15 = 0.60$$

Cubes and Cubes Roots Ex 4.4 Q12

Answer :

Volume of a cube with side s is given by:

$$V = s^3$$

$$\therefore s = \sqrt[3]{V}$$

$$= \sqrt[3]{\frac{24389}{216}}$$

$$= \frac{\sqrt[3]{24389}}{\sqrt[3]{216}}$$

$$= \frac{\sqrt[3]{29 \times 29 \times 29}}{\sqrt[3]{2 \times 2 \times 2 \times 3 \times 3 \times 3}} \quad \text{(By prime factorisation)}$$

$$= \frac{29}{2 \times 3}$$

$$= \frac{29}{6}$$

Thus, the length of the side is $\frac{29}{6}$ m.

********** END *********