Cubes and Cubes Roots Ex 4.4 Q6

Answer :

(i)
We have:

$$0.001728 = \frac{1728}{1000000}$$

$$\therefore \sqrt[3]{0.001728} = \sqrt[3]{\frac{1728}{1000000}} = \frac{\sqrt[3]{1728}}{\sqrt[3]{1000000}}$$

Now

On factorising 1728 into prime factors, we get:
$$1728 = 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 3 \times 3 \times 3$$

On grouping the factors in triples of equal factors, we get:
$$1728 = \{2 \times 2 \times 2\} \times \{2 \times 2 \times 2\} \times \{3 \times 3 \times 3\}$$

Now, taking one factor from each triple, we get:
$$\sqrt[3]{1728} = 2 \times 2 \times 3 = 12$$

Also
$$\sqrt[3]{1000000} = \sqrt[3]{100 \times 100 \times 100} = 100$$

$$\therefore \sqrt[3]{0.001728} = \frac{\sqrt[3]{1728}}{\sqrt[3]{1000000}} = \frac{12}{100} = 0.12$$

(ii)
We have:

$$0.003375 = \frac{3375}{1000000}$$

$$\therefore \sqrt[3]{0.003375} = \sqrt[3]{\frac{3375}{1000000}} = \frac{\sqrt[3]{3375}}{\sqrt[3]{1000000}}$$

Now

On factorising 3375 into prime factors, we get:
$$3375 = 3 \times 3 \times 3 \times 5 \times 5 \times 5$$

On grouping the factors in triples of equal factors, we get:
$$3375 = \{3 \times 3 \times 3\} \times \{5 \times 5 \times 5\}$$

Now, taking one factor from each triple, we get:
$$\sqrt[3]{3375} = 3 \times 5 = 15$$

Also
$$\sqrt[3]{1000000} = \sqrt[3]{100 \times 100 \times 100} = 100$$

$$\therefore \sqrt[3]{0.003375} = \frac{\sqrt[3]{3375}}{\sqrt[3]{1000000}} = \frac{15}{100} = 0.15$$

(iii)
We have:

$$0.001 = \frac{1}{1000}$$

$$\therefore \sqrt[3]{0.001} = \sqrt[3]{\frac{1}{1000}} = \frac{\sqrt[3]{1}}{\sqrt[3]{1000}} = \frac{1}{10} = 0.1$$

(iv)
We have:

$$1.331 = \frac{1331}{1000}$$

$$\therefore \sqrt[3]{1.331} = \sqrt[3]{\frac{1331}{1000}} = \frac{\sqrt[3]{1331}}{\sqrt[3]{1000}} = \frac{\sqrt[3]{11 \times 11 \times 11}}{\sqrt[3]{1000}} = \frac{11}{10} = 1.1$$

Cubes and Cubes Roots Ex 4.4 Q7

Answer :

(i)

To evaluate the value of the given expression, we need to proceed as follows:

$$\sqrt[3]{27} + \sqrt[3]{0.008} + \sqrt[3]{0.064} = \sqrt[3]{3 \times 3 \times 3} + \sqrt[3]{\frac{8}{1000}} + \sqrt[3]{\frac{64}{1000}}$$

$$= \sqrt[3]{3 \times 3 \times 3} + \frac{\sqrt[3]{8}}{\sqrt[3]{1000}} + \frac{\sqrt[3]{64}}{\sqrt[3]{1000}}$$

$$= \sqrt[3]{3 \times 3 \times 3} + \frac{\sqrt[3]{2 \times 2 \times 2}}{\sqrt[3]{1000}} + \frac{\sqrt[3]{4 \times 4 \times 4}}{\sqrt[3]{1000}}$$

$$= 3 + \frac{2}{10} + \frac{4}{10}$$

$$= 3 + 0.2 + 0.4$$

$$= 3.6$$

Thus, the answer is 3.6.

(ii)

To evaluate the value of the given expression, we need to proceed as follows:

$$\sqrt[3]{1000} + \sqrt[3]{0.008} - \sqrt[3]{0.125} = \sqrt[3]{10 \times 10 \times 10} + \sqrt[3]{\frac{8}{1000}} - \sqrt[3]{\frac{125}{1000}}$$

$$= \sqrt[3]{10 \times 10 \times 10} + \frac{\sqrt[3]{8}}{\sqrt[3]{1000}} - \frac{\sqrt[3]{125}}{\sqrt[3]{1000}}$$

$$= \sqrt[3]{10 \times 10 \times 10} + \frac{\sqrt[3]{2^3}}{\sqrt[3]{1000}} - \frac{\sqrt[3]{5^3}}{\sqrt[3]{1000}}$$

$$= 10 + \frac{2}{10} - \frac{5}{10}$$

$$= 10 + 0.2 - 0.5$$

$$= 9.7$$

Thus, the answer is 9.7.

(iii)

To evaluate the value of the given expression, we need to proceed as follows:

$$\sqrt[3]{\frac{729}{216}} \times \frac{6}{9} = \sqrt[3]{\frac{729}{216}} \times \frac{6}{9} = \frac{\sqrt[3]{729}}{\sqrt[3]{216}} \times \frac{6}{9} = \frac{\sqrt[3]{9 \times 9 \times 9}}{\sqrt[3]{2 \times 2 \times 2 \times 3 \times 3 \times 3}} \times \frac{6}{9} = \frac{9}{2 \times 3} \times \frac{6}{9} = \frac{\cancel{9}^1}{\cancel{6}} \times \frac{\cancel{6}^1}{\cancel{9}} = 1$$

Thus, the answer is 1.

(iv)

To evaluate the value of the expression, we need to proceed as follows:

$$\sqrt[3]{\frac{0.027}{0.008}} \div \sqrt{\frac{0.09}{0.04}} - 1 = \sqrt[3]{\frac{\frac{27}{1000}}{\frac{8}{1000}}} \div \sqrt{\frac{\frac{9}{100}}{\frac{4}{100}}} - 1 = \sqrt[3]{\frac{27}{8}} \div \sqrt{\frac{9}{4}} - 1 = \frac{\sqrt[3]{27}}{\sqrt[3]{8}} \div \frac{\sqrt{9}}{\sqrt{4}} - 1 = \frac{3}{2} \div \frac{3}{2}$$

$$- 1 = \frac{\cancel{3}^1}{\cancel{2}} \times \frac{\cancel{2}^1}{\cancel{3}} - 1 = 1 - 1 = 0$$

Thus, the answer is 0.

(v)

To evaluate the value of the expression, we need to proceed as follows:

$$\sqrt[3]{0.1 \times 0.1 \times 0.1 \times 13 \times 13 \times 13} = \sqrt[3]{\frac{1}{10} \times \frac{1}{10} \times \frac{1}{10} \times 13 \times 13 \times 13} = \sqrt[3]{\frac{13 \times 13 \times 13}{10 \times 10 \times 10}}$$

$$= \frac{\sqrt[3]{13 \times 13 \times 13}}{\sqrt[3]{10 \times 10 \times 10}} = \frac{13}{10} = 1.3$$

Thus, the answer is 1.3.

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