Cubes and Cubes Roots Ex 4.4 Q13

Answer :

(i)

36 and 384 are not perfect cubes; therefore, we use the following property:

$\sqrt[3]{ab} = \sqrt[3]{a} \times \sqrt[3]{b}$ for any two integers *a* and *b*

$\therefore \sqrt[3]{36} \times \sqrt[3]{384}$

$= \sqrt[3]{36 \times 384}$

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

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

$= 2 \times 2 \times 2 \times 3$

$= 24$

Thus, the answer is 24.

(ii)

96 and 122 are not perfect cubes; therefore, we use the following property:

$\sqrt[3]{ab} = \sqrt[3]{a} \times \sqrt[3]{b}$ for any two integers *a* and *b*

$\therefore \sqrt[3]{96} \times \sqrt[3]{144}$

$= \sqrt[3]{96 \times 144}$

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

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

$= 2 \times 2 \times 2 \times 3$

$= 24$

Thus, the answer is 24.

(iii)

100 and 270 are not perfect cubes; therefore, we use the following property:

$\sqrt[3]{ab} = \sqrt[3]{a} \times \sqrt[3]{b}$ for any two integers *a* and *b*

$\therefore \sqrt[3]{100} \times \sqrt[3]{270}$

$= \sqrt[3]{100 \times 270}$

$= \sqrt[3]{(2 \times 2 \times 5 \times 5) \times (2 \times 3 \times 3 \times 3 \times 5)}$ (By prime factorisation)

$= \sqrt[3]{\{2 \times 2 \times 2\} \times \{3 \times 3 \times 3\} \times \{5 \times 5 \times 5\}}$

$= 2 \times 3 \times 5$

$= 30$

Thus, the answer is 30.

(iv)
121 and 297 are not perfect cubes; therefore, we use the following property:
$\sqrt[3]{ab} = \sqrt[3]{a} \times \sqrt[3]{b}$ for any two integers a and b

$\therefore \sqrt[3]{121} \times \sqrt[3]{297}$
$= \sqrt[3]{121 \times 297}$

$= \sqrt[3]{(11 \times 11) \times (3 \times 3 \times 3 \times 11)}$ (By prime factorisation)

$= \sqrt[3]{\{11 \times 11 \times 11\} \times \{3 \times 3 \times 3\}}$
$= 11 \times 3$
$= 33$

Thus, the answer is 33.

Cubes and Cubes Roots Ex 4.4 Q14

Answer :

(i)
To find the cube root, we use the following property:
$\sqrt[3]{ab} = \sqrt[3]{a} \times \sqrt[3]{b}$ for two integers a and b

Now

$\sqrt[3]{3048625}$
$= \sqrt[3]{3375 \times 729}$
$= \sqrt[3]{3375} \times \sqrt[3]{729}$ (By the above property)
$= \sqrt[3]{3 \times 3 \times 3 \times 5 \times 5 \times 5} \times \sqrt[3]{9 \times 9 \times 9}$ (By prime factorisation)
$= \sqrt[3]{\{3 \times 3 \times 3\} \times \{5 \times 5 \times 5\}} \times \sqrt[3]{\{9 \times 9 \times 9\}}$
$= 3 \times 5 \times 9$
$= 135$

Thus, the answer is 135.

(ii)
To find the cube root, we use the following property:
$\sqrt[3]{ab} = \sqrt[3]{a} \times \sqrt[3]{b}$ for two integers a and b

Now

$\sqrt[3]{20346417}$
$= \sqrt[3]{9261 \times 2197}$
$= \sqrt[3]{9261} \times \sqrt[3]{2197}$ (By the above property)
$= \sqrt[3]{3 \times 3 \times 3 \times 7 \times 7 \times 7} \times \sqrt[3]{13 \times 13 \times 13}$ (By prime factorisation)
$= \sqrt[3]{\{3 \times 3 \times 3\} \times \{7 \times 7 \times 7\}} \times \sqrt[3]{\{13 \times 13 \times 13\}}$
$= 3 \times 7 \times 13$
$= 273$

Thus, the answer is 273.

(iii)
To find the cube root, we use the following property:
$\sqrt[3]{ab} = \sqrt[3]{a} \times \sqrt[3]{b}$ for two integers *a* and *b*

Now

$\sqrt[3]{210644875}$
$= \sqrt[3]{42875 \times 4913}$
$= \sqrt[3]{42875} \times \sqrt[3]{4913}$ (By the above property)
$= \sqrt[3]{5 \times 5 \times 5 \times 7 \times 7 \times 7} \times \sqrt[3]{17 \times 17 \times 17}$ (By prime factorisation)
$= \sqrt[3]{\{5 \times 5 \times 5\} \times \{7 \times 7 \times 7\}} \times \sqrt[3]{\{17 \times 17 \times 17\}}$
$= 5 \times 7 \times 17$
$= 595$
Thus, the answer is 595.

(iv)
To find the cube root, we use the following property:
$\sqrt[3]{ab} = \sqrt[3]{a} \times \sqrt[3]{b}$ for two integers *a* and *b*

Now

$\sqrt[3]{57066625}$
$= \sqrt[3]{166375 \times 343}$
$= \sqrt[3]{166375} \times \sqrt[3]{343}$ (By the above property)
$= \sqrt[3]{5 \times 5 \times 5 \times 11 \times 11 \times 11} \times \sqrt[3]{7 \times 7 \times 7}$ (By prime factorisation)
$= \sqrt[3]{\{5 \times 5 \times 5\} \times \{11 \times 11 \times 11\}} \times \sqrt[3]{\{7 \times 7 \times 7\}}$
$= 5 \times 11 \times 7$
$= 385$

Thus, the answer is 385.

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