

Cubes and Cube Roots

Ex 4A

Q1

Answer :

(i) $(8)^3 = (8 \times 8 \times 8) = 512$.

Thus, the cube of 8 is 512.

(ii) $(15)^3 = (15 \times 15 \times 15) = 3375$.

Thus, the cube of 15 is 3375.

(iii) $(21)^3 = (21 \times 21 \times 21) = 9261$.

Thus, the cube of 21 is 9261.

(iv) $(60)^3 = (60 \times 60 \times 60) = 216000$.

Thus, the cube of 60 is 216000.

Q2

Answer :

(i) $(1.2)^3 = (1.2 \times 1.2 \times 1.2) = 1.728$

Thus, the cube of 1.2 is 1.728.

(ii) $(3.5)^3 = (3.5 \times 3.5 \times 3.5) = 42.875$

Thus, the cube of 3.5 is 42.875.

(iii) $(0.8)^3 = (0.8 \times 0.8 \times 0.8) = 0.512$

Thus, the cube of 0.8 is 0.512.

(iv) $(0.05)^3 = (0.05 \times 0.05 \times 0.05) = 0.000125$

Thus, the cube of 0.05 is 0.000125.

Q3

Answer :

(i) $\left(\frac{4}{7}\right)^3 = \left(\frac{4}{7} \times \frac{4}{7} \times \frac{4}{7}\right) = \left(\frac{64}{343}\right)$

Thus, the cube of $\left(\frac{4}{7}\right)$ is $\left(\frac{64}{343}\right)$.

(ii) $\left(\frac{10}{11}\right)^3 = \left(\frac{10}{11} \times \frac{10}{11} \times \frac{10}{11}\right) = \left(\frac{1000}{1331}\right)$

Thus, the cube of $\left(\frac{10}{11}\right)$ is $\left(\frac{1000}{1331}\right)$.

(iii) $\left(\frac{1}{15}\right)^3 = \left(\frac{1}{15} \times \frac{1}{15} \times \frac{1}{15}\right) = \left(\frac{1}{3375}\right)$

Thus, the cube of $\left(\frac{1}{15}\right)$ is $\left(\frac{1}{3375}\right)$ $\left(1\frac{3}{10}\right)^3 = \left(\frac{13}{10}\right)^3 = \left(\frac{13}{10} \times \frac{13}{10} \times \frac{13}{10}\right) = \left(\frac{2197}{1000}\right)$

Thus, the cube of $\left(1\frac{3}{10}\right)$ is $\left(\frac{2197}{1000}\right)$.

Q4

Answer :

(i) 125

Resolving 125 into prime factors:

$$125 = 5 \times 5 \times 5$$

Here, one triplet is formed, which is 5^3 . Hence, 125 can be expressed as the product of the triplets of 5.

Therefore, 125 is a perfect cube.

(ii) 243 is not a perfect cube.

(iii) 343

Resolving 125 into prime factors:

$$343 = 7 \times 7 \times 7$$

Here, one triplet is formed, which is 7^3 . Hence, 343 can be expressed as the product of the triplets of 7.

Therefore, 343 is a perfect cube.

(iv) 256 is not a perfect cube.

(v) 8000

Resolving 8000 into prime factors:

$$8000 = 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 5 \times 5 \times 5$$

Here, three triplets are formed, which are 2^3 , 2^3 and 5^3 . Hence, 8000 can be expressed as the product of the triplets of 2, 2 and 5, i.e. $2^3 \times 2^3 \times 5^3 = 20^3$.

Therefore, 8000 is a perfect cube.

(vi) 9261

Resolving 9261 into prime factors:

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

Here, two triplets are formed, which are 3^3 and 7^3 . Hence, 9261 can be expressed as the product of the triplets of 3 and 7, i.e. $3^3 \times 7^3 = 21^3$.

Therefore, 9261 is a perfect cube.

(vii) 5324 is not a perfect cube.

(viii) 3375 .

Resolving 3375 into prime factors:

$$3375 = 3 \times 3 \times 3 \times 5 \times 5 \times 5.$$

Here, two triplets are formed, which are 3^3 and 5^3 . Hence, 3375 can be expressed as the product of the triplets of 3 and 5, i.e. $3^3 \times 5^3 = 15^3$.

Therefore, 3375 is a perfect cube.

Q5

Answer :

The cubes of even numbers are always even. Therefore, 216, 512 and 1000 are the cubes of even numbers.

$$216 = 2 \times 2 \times 2 \times 3 \times 3 \times 3 = 2^3 \times 3^3 = 6^3$$

$$512 = 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 = 2^3 \times 2^3 \times 2^3 = 8^3$$

$$1000 = 2 \times 2 \times 2 \times 5 \times 5 \times 5 = 2^3 \times 5^3 = 10^3$$

Q6

Answer :

The cube of an odd number is an odd number. Therefore, 125, 343 and 9261 are the cubes of odd numbers.

$$125 = 5 \times 5 \times 5 = 5^3$$

$$343 = 7 \times 7 \times 7 = 7^3$$

$$9261 = 3 \times 3 \times 3 \times 7 \times 7 \times 7 = 3^3 \times 7^3 = 21^3$$

Q7

Answer :

$$1323$$

$$\begin{array}{r|l} 3 & 1323 \\ \hline 3 & 441 \\ \hline 3 & 147 \\ \hline 7 & 49 \\ \hline 7 & 7 \\ \hline & 1 \end{array}$$

$$1323 = 3 \times 3 \times 3 \times 7 \times 7.$$

To make it a perfect cube, it has to be multiplied by 7.

Q8

Answer :

$$2560$$

2560 can be expressed as the product of prime factors in the following manner:

$$\begin{array}{r|l} 2 & 2560 \\ \hline 2 & 1280 \\ \hline 2 & 640 \\ \hline 2 & 320 \\ \hline 2 & 160 \\ \hline 2 & 80 \\ \hline 2 & 40 \\ \hline 2 & 20 \\ \hline 2 & 10 \\ \hline 5 & 5 \\ \hline & 1 \end{array}$$

$$2560 = 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 5$$

To make this a perfect square, we have to multiply it by 5×5 .

Therefore, 2560 should be multiplied by 25 so that the product is a perfect cube.

Q9

Answer :

1600

1600 can be expressed as the product of prime factors in the following manner:

$$\begin{array}{r|l} 2 & 1600 \\ \hline 2 & 800 \\ \hline 2 & 400 \\ \hline 2 & 200 \\ \hline 2 & 100 \\ \hline 2 & 50 \\ \hline 5 & 25 \\ \hline 5 & 5 \\ \hline & 1 \end{array}$$

$$1600 = 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 5 \times 5$$

Therefore, to make the quotient a perfect cube, we have to divide 1600 by:

$$5 \times 5 = 25$$

Q10

Answer :

$$\begin{array}{r|l} 2 & 8788 \\ \hline 2 & 4394 \\ \hline 13 & 2197 \\ \hline 13 & 169 \\ \hline 13 & 13 \\ \hline & 1 \end{array}$$

8788

8788 can be expressed as the product of prime factors as $2 \times 2 \times 13 \times 13 \times 13$.

Therefore, 8788 should be divided by 4, i.e. (2×2) , so that the quotient is a perfect cube.

Cubes and Cube Roots

Ex 4B

Q1

Answer :

$$(25)^3$$

Here, $a = 2$ and $b = 5$

Using the formula $a^3 + 3a^2b + 3ab^2 + b^3$:

4	4	25	25
$\times 2$	$\times 15$	$\times 6$	$\times 5$
8	60	150	125
+7	+ 16	+ 12	
15	76	162	

$$\therefore (25)^3 = 15625$$

Q2

Answer :

$$(47)^3$$

Here, $a = 4$ and $b = 7$

Using the formula $a^3 + 3a^2b + 3ab^2 + b^3$:

16	16	49	49
$\times 4$	$\times 21$	$\times 12$	$\times 7$
64	336	588	343
+39	+ 62	+ 34	
103	398	622	

$$\therefore (47)^3 = 103823$$

Q3

Answer :

$$(68)^3$$

Here, $a = 6$ and $b = 8$

Using the formula $a^3 + 3a^2b + 3ab^2 + b^3$:

36	36	64	64
$\times 6$	$\times 24$	$\times 18$	$\times 8$
216	864	1152	512
+ 98	+ 120	+ 51	
314	984	1203	

$$\therefore (68)^3 = 314432$$

Q4

Answer :

$$(84)^3$$

Here, $a = 8$ and $b = 4$

Using the formula $a^3 + 3a^2b + 3ab^2 + b^3$:

64	64	16	16
$\times 8$	$\times 12$	$\times 24$	$\times 4$
512	768	384	64
+ 80	+ 39	+ 6	
592	807	390	

$$\therefore (84)^3 = 592704$$

Cubes and Cube Roots

Ex 4C

Q1

Answer :

$$\sqrt[3]{64}$$

By prime factorisation:

$$\begin{aligned} 64 &= 2 \times 2 \times 2 \times 2 \times 2 \times 2 \\ &= (2 \times 2 \times 2) \times (2 \times 2 \times 2) \end{aligned}$$

$$\therefore \sqrt[3]{64} = \sqrt[3]{(2)^3 \times (2)^3} = (2 \times 2) = 4$$

Q2

Answer :

$$\sqrt[3]{343}$$

By prime factorisation:

$$\begin{aligned} 343 &= 7 \times 7 \times 7 \\ &= (7 \times 7 \times 7) \end{aligned}$$

$$\therefore \sqrt[3]{343} = \sqrt[3]{7^3} = 7$$

Q3

Answer :

$$\sqrt[3]{729}$$

By prime factorisation:

$$\begin{array}{r|l} 3 & 729 \\ \hline 3 & 243 \\ \hline 3 & 81 \\ \hline 3 & 27 \\ \hline 3 & 9 \\ \hline 3 & 3 \\ \hline & 1 \end{array}$$

$$\begin{aligned} 729 &= 3 \times 3 \times 3 \times 3 \times 3 \times 3 \\ &= (3 \times 3 \times 3) \times (3 \times 3 \times 3) \end{aligned}$$

$$\therefore \sqrt[3]{729} = (3 \times 3) = 9$$

Q4

Answer :

$$\sqrt[3]{1728}$$

By prime factorisation:

$$\begin{array}{r|l} 2 & 1728 \\ \hline 2 & 864 \\ \hline 2 & 432 \\ \hline 2 & 216 \\ \hline 2 & 108 \\ \hline 2 & 54 \\ \hline 3 & 27 \\ \hline 3 & 9 \\ \hline 3 & 3 \\ \hline & 1 \end{array}$$

$$\begin{aligned} 1728 &= 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 3 \times 3 \times 3 \\ &= (2 \times 2 \times 2) \times (2 \times 2 \times 2) \times (3 \times 3 \times 3) = 2^3 \times 2^3 \times 3^3 \end{aligned}$$

$$\therefore \sqrt[3]{1728} = (2 \times 2 \times 3) = 12$$

Q5

Answer :

$$\sqrt[3]{9261}$$

By prime factorisation:

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

$$\begin{aligned} 9261 &= 3 \times 3 \times 3 \times 7 \times 7 \times 7 \\ &= (3 \times 3 \times 3) \times (7 \times 7 \times 7) = 3^3 \times 7^3 \end{aligned}$$

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

Q6

Answer :

$$\sqrt[3]{4096}$$

By prime factorisation:

$$\begin{array}{r|l} 2 & 4096 \\ \hline 2 & 2048 \\ \hline 2 & 1024 \\ \hline 2 & 512 \\ \hline 2 & 256 \\ \hline 2 & 128 \\ \hline 2 & 64 \\ \hline 2 & 32 \\ \hline 2 & 16 \\ \hline 2 & 8 \\ \hline 2 & 4 \\ \hline 2 & 2 \\ \hline & 1 \end{array}$$

$$\begin{aligned} 4096 &= 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \\ &= (2 \times 2 \times 2) \times (2 \times 2 \times 2) \times (2 \times 2 \times 2) \times (2 \times 2 \times 2) \\ &= 2^3 \times 2^3 \times 2^3 \times 2^3 \end{aligned}$$

$$\therefore \sqrt[3]{4096} = (2 \times 2 \times 2 \times 2) = 16$$

Q7

Answer :

$$\sqrt[3]{8000}$$

By prime factorisation:

$$\begin{array}{r|l} 2 & 8000 \\ \hline 2 & 4000 \\ \hline 2 & 2000 \\ \hline 2 & 1000 \\ \hline 2 & 500 \\ \hline 2 & 250 \\ \hline 5 & 125 \\ \hline 5 & 25 \\ \hline 5 & 5 \\ \hline & 1 \end{array}$$

$$\begin{aligned} 8000 &= 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 5 \times 5 \times 5 \\ &= (2 \times 2 \times 2) \times (2 \times 2 \times 2) \times (5 \times 5 \times 5) \end{aligned}$$

$$\therefore \sqrt[3]{8000} = (2 \times 2 \times 5) = 20$$

Q8

Answer :

$$\sqrt[3]{3375}$$

By prime factorisation:

$$\begin{array}{r|l} 5 & 3375 \\ \hline 5 & 675 \\ \hline 5 & 135 \\ \hline 3 & 27 \\ \hline 3 & 9 \\ \hline 3 & 3 \\ \hline & 1 \end{array}$$

$$\begin{aligned} 3375 &= 3 \times 3 \times 3 \times 5 \times 5 \times 5 \\ &= (3 \times 3 \times 3) \times (5 \times 5 \times 5) \end{aligned}$$

$$\therefore \sqrt[3]{3375} = (3 \times 5) = 15$$

Q9

Answer :

$$\sqrt[3]{-216}$$

By prime factorisation:

$$\begin{array}{r|l} 2 & 216 \\ \hline 2 & 108 \\ \hline 2 & 54 \\ \hline 3 & 27 \\ \hline 3 & 9 \\ \hline 3 & 3 \\ \hline & 1 \end{array}$$

$$\begin{aligned} 216 &= 2 \times 2 \times 2 \times 3 \times 3 \times 3 \\ &= (2 \times 2 \times 2) \times (3 \times 3 \times 3) \end{aligned}$$

$$\sqrt[3]{-216} = -(2 \times 3) = -6$$

$$\therefore \sqrt[3]{-216} = -(\sqrt[3]{216}) = -6$$

Q10

Answer :

$$\sqrt[3]{-512}$$

By prime factorisation:

$$\begin{array}{r|l} 2 & 512 \\ \hline 2 & 256 \\ \hline 2 & 128 \\ \hline 2 & 64 \\ \hline 2 & 32 \\ \hline 2 & 16 \\ \hline 2 & 8 \\ \hline 2 & 4 \\ \hline 2 & 2 \\ \hline & 1 \end{array}$$

$$\begin{aligned}\sqrt[3]{512} &= 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \\ &= (2 \times 2 \times 2) \times (2 \times 2 \times 2) \times (2 \times 2 \times 2) \\ \sqrt[3]{-512} &= -\sqrt[3]{(2 \times 2 \times 2)} = -8\end{aligned}$$

$$\therefore \sqrt[3]{-512} = -(\sqrt[3]{512}) = -8$$

Q11

Answer :

$$\sqrt[3]{-1331}$$

By prime factorisation:

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

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

$$\begin{aligned}\sqrt[3]{-1331} &= -(11 \times 11 \times 11)^{\frac{1}{3}} = -11 \\ \therefore \sqrt[3]{-1331} &= -(\sqrt[3]{1331}) = -11\end{aligned}$$

Q12

Answer :

$$\sqrt[3]{\frac{27}{64}}$$

By prime factorisation:

$$\begin{array}{r|l} 3 & 27 \\ \hline 3 & 9 \\ \hline 3 & 3 \\ \hline & 1 \end{array} \quad \begin{array}{r|l} 2 & 64 \\ \hline 2 & 32 \\ \hline 2 & 16 \\ \hline 2 & 8 \\ \hline 2 & 4 \\ \hline 2 & 2 \\ \hline & 1 \end{array}$$

$$\begin{aligned}\sqrt[3]{\frac{27}{64}} &= \frac{\sqrt[3]{27}}{\sqrt[3]{64}} = \frac{\sqrt[3]{(3 \times 3 \times 3)}}{\sqrt[3]{(2 \times 2 \times 2) \times (2 \times 2 \times 2)}} = \frac{\sqrt[3]{(3 \times 3 \times 3)}}{\sqrt[3]{(4 \times 4 \times 4)}} = \frac{3}{4} \\ \therefore \sqrt[3]{\frac{27}{64}} &= \frac{3}{4}\end{aligned}$$

Q13

Answer :

$$\sqrt[3]{\frac{125}{216}}$$

By prime factorisation:

$$\begin{array}{r|l} 5 & 125 \\ \hline 5 & 25 \\ \hline 5 & 5 \\ \hline & 1 \end{array} \quad \begin{array}{r|l} 2 & 216 \\ \hline 2 & 108 \\ \hline 2 & 54 \\ \hline 3 & 27 \\ \hline 3 & 9 \\ \hline 3 & 3 \\ \hline & 1 \end{array}$$

$$\sqrt[3]{\frac{125}{216}} = \frac{\sqrt[3]{5 \times 5 \times 5}}{\sqrt[3]{(2 \times 2 \times 2) \times (3 \times 3 \times 3)}} = \frac{\sqrt[3]{5 \times 5 \times 5}}{\sqrt[3]{(6 \times 6 \times 6)}} = \frac{5}{6}$$

$$\therefore \sqrt[3]{\frac{125}{216}} = \frac{5}{6}$$

Q14

Answer :

$$\sqrt[3]{\frac{-27}{125}}$$

$$\begin{array}{r|l} 3 & 27 \\ \hline 3 & 9 \\ \hline 3 & 3 \\ \hline & 1 \end{array} \quad \begin{array}{r|l} 5 & 125 \\ \hline 5 & 25 \\ \hline 5 & 5 \\ \hline & 1 \end{array}$$

By factorisation:

$$\sqrt[3]{\frac{27}{125}} = \sqrt[3]{\frac{3 \times 3 \times 3}{5 \times 5 \times 5}}$$

$$\therefore \sqrt[3]{\frac{-27}{125}} = \frac{-3}{5}$$

Q15

Answer :

$$\sqrt[3]{\frac{-64}{343}}$$

On factorisation:

$$\begin{array}{r|l} 2 & 64 \\ \hline 2 & 32 \\ \hline 2 & 16 \\ \hline 2 & 8 \\ \hline 2 & 4 \\ \hline 2 & 2 \\ \hline & 1 \end{array} \quad \begin{array}{r|l} 7 & 343 \\ \hline 7 & 49 \\ \hline 7 & 7 \\ \hline & 1 \end{array}$$

$$\sqrt[3]{\frac{64}{343}} = \sqrt[3]{\frac{2 \times 2 \times 2 \times 2 \times 2 \times 2}{7 \times 7 \times 7}}$$

$$\therefore \sqrt[3]{\frac{-64}{343}} = \frac{-4}{7}$$

Q16

Answer :

$$\begin{aligned} \sqrt[3]{64 \times 729} &= \sqrt[3]{64} \times \sqrt[3]{729} \\ \sqrt[3]{64 \times 729} &= \sqrt[3]{4 \times 4 \times 4} \times \sqrt[3]{(3 \times 3 \times 3) \times (3 \times 3 \times 3)} \\ &= \sqrt[3]{4 \times 4 \times 4} \times \sqrt[3]{(9 \times 9 \times 9)} \\ \sqrt[3]{64 \times 729} &= (4) \times (9) = 36 \end{aligned}$$

Q17

Answer :

$$\sqrt[3]{\frac{729}{1000}}$$

$$\begin{array}{r|l} 3 & 729 \\ \hline 3 & 243 \\ \hline 3 & 81 \\ \hline 3 & 27 \\ \hline 3 & 9 \\ \hline 3 & 3 \\ \hline & 1 \end{array} \quad \begin{array}{r|l} 2 & 1000 \\ \hline 2 & 500 \\ \hline 2 & 250 \\ \hline 5 & 125 \\ \hline 5 & 25 \\ \hline 5 & 5 \\ \hline & 1 \end{array}$$

On factorisation:

$$\sqrt[3]{\frac{729}{1000}} = \frac{\sqrt[3]{(3 \times 3 \times 3) \times (3 \times 3 \times 3)}}{\sqrt[3]{(2 \times 2 \times 2) \times (5 \times 5 \times 5)}} = \frac{\sqrt[3]{9 \times 9 \times 9}}{\sqrt[3]{10 \times 10 \times 10}}$$

$$\sqrt[3]{\frac{729}{1000}} = \frac{9}{10}$$

Q18

Answer :

$$\sqrt[3]{\frac{-512}{343}}$$

By factorisation:

$$\begin{array}{r} 2 \overline{) 512} \\ 2 \overline{) 256} \\ 2 \overline{) 128} \\ 2 \overline{) 64} \\ 2 \overline{) 32} \\ 2 \overline{) 16} \\ 2 \overline{) 8} \\ 2 \overline{) 4} \\ 2 \overline{) 2} \\ \hline 1 \end{array}$$

$$\begin{array}{r} 7 \overline{) 343} \\ 7 \overline{) 49} \\ 7 \overline{) 7} \\ \hline 1 \end{array}$$

$$\begin{aligned} \sqrt[3]{\frac{512}{343}} &= \frac{\sqrt[3]{8 \times 8 \times 8}}{\sqrt[3]{7 \times 7 \times 7}} \\ \sqrt[3]{\frac{-512}{343}} &= \frac{-8}{7} \end{aligned}$$

Cubes and Cube Roots

Ex 4D

Q1

Answer :

(a)

141 is not a perfect cube.

(b)

294 is not a perfect cube.

(c) (✓)

216 is a perfect cube.

$$216 = (2 \times 2 \times 2) \times (3 \times 3 \times 3) = (2^3) \times (3^3) = 6^3$$

(d)

496 is not a perfect cube.

Q2

Answer :

(a)

$$1152 = 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 3 \times 3 = (2)^3 \times (2)^3 \times (2 \times 3 \times 3).$$

Hence, 1152 is not a perfect cube.

(b) (✓)

$$1331 = 11 \times 11 \times 11 = (11)^3$$

Hence, 1331 is a perfect cube.

(c)

$$2016 = 2 \times 2 \times 2 \times 2 \times 2 \times 3 \times 3 \times 7 = (2)^3 \times 2 \times 2 \times 3 \times 3 \times 7$$

Hence, 2016 is not a perfect cube.

(d)

739 is not a perfect cube.

Q3

Answer :

(c) 8

$$\sqrt[3]{512} = \sqrt[3]{2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2} = \sqrt[3]{(2 \times 2 \times 2) \times (2 \times 2 \times 2) \times (2 \times 2 \times 2)}$$
$$\sqrt[3]{512} = \sqrt[3]{(2)^3 \times (2)^3 \times (2)^3} = 8$$

Hence, the cube root of 512 is 8.

Q4

Answer :

(c) 20

$$\sqrt[3]{125 \times 64} = \sqrt[3]{125} \times \sqrt[3]{64} = \sqrt[3]{5 \times 5 \times 5} \times \sqrt[3]{2 \times 2 \times 2 \times 2 \times 2}$$
$$\sqrt[3]{125 \times 64} = \sqrt[3]{(5)^3} \times \sqrt[3]{(2)^3 \times (2)^3} = \sqrt[3]{(5)^3} \times \sqrt[3]{(4)^3}$$
$$\sqrt[3]{125 \times 64} = 5 \times 4 = 20$$

Hence, the cube root of $\sqrt[3]{125 \times 64}$ is 20.

Q5

Answer :

(b) $\frac{4}{7}$

$$\sqrt[3]{\frac{64}{343}} = \frac{\sqrt[3]{64}}{\sqrt[3]{343}} = \frac{\sqrt[3]{4 \times 4 \times 4}}{\sqrt[3]{7 \times 7 \times 7}} = \frac{\sqrt[3]{(4)^3}}{\sqrt[3]{(7)^3}}$$
$$\sqrt[3]{\frac{64}{343}} = \frac{4}{7}$$
$$\therefore \sqrt[3]{\frac{64}{343}} = \frac{4}{7}$$

Q6

Answer :

(b) $\frac{-8}{9}$

$$\sqrt[3]{\frac{-512}{729}} = \frac{\sqrt[3]{-512}}{\sqrt[3]{729}} = \frac{\sqrt[3]{(-8) \times (-8) \times (-8)}}{\sqrt[3]{9 \times 9 \times 9}} = \frac{\sqrt[3]{(-8)^3}}{\sqrt[3]{(9)^3}}$$
$$\sqrt[3]{\frac{-512}{729}} = \frac{-8}{9}$$
$$\therefore \sqrt[3]{\frac{-512}{729}} = \frac{-8}{9}$$

Q7

Answer :

(c) 9

$$\begin{array}{r} 2 \overline{) 648} \\ \underline{2 324} \\ 2 162 \\ \underline{3 81} \\ 3 27 \\ \underline{3 9} \\ 3 3 \\ \underline{3 0} \\ 0 \end{array}$$

$$648 = 2 \times 2 \times 2 \times 3 \times 3 \times 3 \times 3 = (2)^3 \times (3)^3 \times 3$$

Therefore, to get a perfect cube, we need to multiply 648 by 9, i.e. (3×3) .

Q8

Answer :

(a) 3

$$\begin{array}{r} 2 \overline{) 1536} \\ \underline{2 768} \\ 2 384 \\ \underline{2 192} \\ 2 96 \\ \underline{2 48} \\ 2 24 \\ \underline{2 12} \\ 2 6 \\ \underline{3 1} \\ \hline \end{array}$$

$$1536 = 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 3 = (2)^3 \times (2)^3 \times (2)^3 \times 3$$

Therefore, to get a perfect cube, we need to divide 1536 by 3.

Q9

Answer :

$$(c) 2 \frac{197}{1000}$$

$$\left(1 \frac{3}{10}\right)^3 = \left(\frac{13}{10}\right)^3 = \frac{(13)^3}{(10)^3} = \frac{(13 \times 13 \times 13)}{(10 \times 10 \times 10)}$$

$$\left(1 \frac{3}{10}\right)^3 = \frac{2197}{1000} = 2 \frac{197}{1000}$$

$$\therefore \left(1 \frac{3}{10}\right)^3 = 2 \frac{197}{1000}$$

Q10

Answer :

$$(c) 0.512$$

$$(0.8)^3 = (0.8) \times (0.8) \times (0.8) = 0.512$$

$$\therefore (0.8)^3 = 0.512$$