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Chapter-4 Cube and Cube Root

Exercise - 4 (A)

1. i) $7^3 = 7 \times 7 \times 7$
$= 343$ (Ans)

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

iii) $16^3 = 16 \times 16 \times 16$
$= 4096.$

iv) $23^3 = 23 \times 23 \times 23$
$= 12167$

v) $31^3 = 31 \times 31 \times 31$
$= 29791$

vi) $42^3 = 42 \times 42 \times 42$
$= 74088$

vii) $54^3 = 54 \times 54 \times 54$
$= 157464$

2. i) $243 = \sqrt[3]{243}$
$= 3 \times 3 \times 3 \times 3 \times 3$
$=$ Not perfect

ii) $588 = \sqrt[3]{588}$
$= 2 \times 2 \times 2 \times 71$
$\Rightarrow$ not perfect.

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

$= 11 \times 11 \times 11$

$=$ Perfect

$24000 = \sqrt[3]{24000}$

$= 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 3 \times 5 \times 5 \times 5$

$\Rightarrow$ Not perfect.

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

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

$\Rightarrow$ Perfect

$1938 = \sqrt[3]{1938}$

$= 2 \times 3 \times 323$

$\Rightarrow$ Not Perfect

i) $2.1 = \sqrt[3]{\quad} \left(\frac{21}{10}\right)^3$

$= \frac{21}{10} \times \frac{21}{10} \times \frac{21}{10} = \frac{9261}{1000}$

$\Rightarrow 9.261$ Ans

$0.4 = \left(\frac{4}{10}\right) = \frac{4}{10} \times \frac{4}{10} \times \frac{4}{10} = \frac{64}{1000} = 0.064$ Ans

iii) $1.6 = \left(\frac{16}{10}\right)^3 = \frac{16}{10} \times \frac{16}{10} \times \frac{16}{10} = \frac{4096}{1000} = 4.096$

iv) $2.5 = \left(\frac{25}{10}\right)^3 = \frac{25}{10} \times \frac{25}{10} \times \frac{25}{10} = \frac{15625}{1000} = 15.625$

v) $0.12 = \left(\frac{12}{100}\right)^3 = \frac{12}{100} \times \frac{12}{100} \times \frac{12}{100} = \frac{2728}{1000000} = 0.002728$

vi) $0.02 = \left(\frac{2}{100}\right)^3 = \frac{2}{100} \times \frac{2}{100} \times \frac{2}{100} = \frac{8}{1000000} = 0.000008$

vii) $0.8 = \left(\frac{8}{10}\right)^3 = \frac{8}{10} \times \frac{8}{10} \times \frac{8}{10} = \frac{512}{1000} = 0.512$

4. i) $\frac{3}{7} = \left(\frac{3}{7}\right)^3 = \frac{3 \times 3 \times 3}{7 \times 7 \times 7} = \frac{27}{343}$

ii) $\frac{8}{9} = \left(\frac{8}{9}\right)^3 = \frac{8 \times 8 \times 8}{9 \times 9 \times 9} = \frac{512}{729}$

iii) $\frac{10}{13} = \left(\frac{10}{13}\right)^3 = \frac{10 \times 10 \times 10}{13 \times 13 \times 13} = \frac{1000}{2197}$.

iv) $\frac{9}{7} = \left(\frac{9}{7}\right)^3 = \frac{729}{343}$.

v) $\frac{5}{2} = \left(\frac{5}{3}\right)^3 = \frac{125}{8}$

i) $(-3)^3 = (-3 \times -3 \times -3)$
$= -27.$

ii) $(-7)^3 = (-7 \times -7 \times -7)$
$= -343$

iii) $(-12)^3 = (-12 \times -12 \times -12)$
$= -1728$

iv) $(-18)^3 = (-18 \times -18 \times -18)$
$= -5832$

v) $(-25)^3 = -25 \times -25 \times -25$
$= -15625$

vi) $(-30)^3 = -30 \times -30 \times -30$
$= -27000$

vii) $(-50)^3 = -50 \times -50 \times -50$
$= -125000$

i) an even number
= 216, 8000, 4096.

ii) an odd number
= 729, 3375, 125, 343, 9261

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

Clearly, 1323 must be multiplied by 7.

$1323 \times 7 = (3 \times 3 \times 3 \times 7 \times 7) \times 7$

$= \frac{3 \times 3 \times 3 \times 7 \times 7 \times 7}{21^3}$

$8768 = 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 137$

$\Rightarrow$ 137

$\Rightarrow$ 1.

Clearly, 8768 must be divided by 137.

$27783 = 3 \times 3 \times 3 \times 3 \times 7 \times 7 \times 7$

$= 3 \times 3$

$\Rightarrow 9.$

$8640 = 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 3 \times 3 \times 3 \times 5$

$\Rightarrow 5$ Ans

Exercise - 4B

i) $64 = 2 \times 2 \times 2 \times 4 \times 4 \times 4$
$\Rightarrow 4^3$

ii) $343 = 7 \times 7 \times 7$
$\Rightarrow 7^3$.

iii) $729 = 9 \times 9 \times 9$
$\Rightarrow 9^3$

iv) $1728 = 12 \times 12 \times 12$
$\Rightarrow 12^3$

v) $9261 = 21 \times 21 \times 21$
$\Rightarrow 21^3$

vi) $4096 = 16 \times 16 \times 16$
$= 16^3$

vii) $8000 = 20 \times 20 \times 20$
$= 20^3$

viii) $3375 = 15 \times 15 \times 15$
$= 15^3$

i) $\frac{27}{64} = \frac{3 \times 3 \times 3}{4 \ 4 \ 4} = \left(\frac{3}{4}\right)^3$

ii) $\frac{125}{216} = \frac{5 \times 5 \times 5}{6 \ 6 \ 6} = \left(\frac{5}{6}\right)^3$

(iii) $\frac{343}{512} = \frac{7}{8} \times \frac{7}{8} \times \frac{7}{8} = \frac{7}{8}$.

(iv) $64 \times 729 = (4 \times 4 \times 4) \times (9 \times 9 \times 9)$

$\Rightarrow 4 \times 9$

$\Rightarrow 36$.

v) $64 \times 27 = (4 \times 4 \times 4) \times (3 \times 3 \times 3)$

$\Rightarrow 4 \times 3$

$\Rightarrow 12$.

vi) 729×8000

$\Rightarrow (9 \times 9 \times 9) \times (20 \times 20 \times 20)$

$\Rightarrow 9 \times 20$

$\Rightarrow 180$.

vii) 3375×512

$\Rightarrow (15 \times 15 \times 15) \times (8 \times 8 \times 8)$

$\Rightarrow 15 \times 8$

$\Rightarrow 120$.

3. i) $-216 = -6 \times -6 \times -6$

$\Rightarrow (-6)^3$.

ii) $-512 = -8 \times -8 \times -8$

$= (-8)^3$

iii) $-1331 = -11 \times -11 \times -11$

$= (-11)^3$

iv) $\frac{-27}{125} = \frac{-3}{5} \times \frac{-3}{5} \times \frac{-3}{5} = \left(\frac{-3}{5}\right)^3$

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

vi) $\frac{-512}{343} = \frac{-8}{7} \times \frac{-8}{7} \times \frac{-8}{7} = \left(\frac{-8}{7}\right)^3$

vii) $-2197 = -13 \times -13 \times -13 = (-13)^3$

viii) $-5832 = -18 \times -18 \times -18 = (-18)^3$

ix) $-2744000 =$

4. i) $2.744 = 1.4 \times 1.4 \times 1.4$
$= 1.4$

ii) $9.261 = 2.1 \times 2.1 \times 2.1$
$= 2.1$

iii) 0.000027
$\Rightarrow 0.03 \times 0.03 \times 0.03$
$\Rightarrow 0.03$

iv) 0.512
$\Rightarrow 0.8 \times 0.8 \times 0.8$
$\Rightarrow 0.8$

v) -15.625

$\Rightarrow -2.5 \times -2.5 \times -2.5$

$= -2.5$

vi) -125×1000

$\Rightarrow (5 \times -5 \times -5) \times (10 \times 10 \times 10)$

$\Rightarrow -5 \times 10$

$\Rightarrow$

8. 7. i) $700 \times 2 \times 49 \times 5$

$\Rightarrow 70$

ii) -216×1728

$\Rightarrow -72$

iii) -64×-125

$\Rightarrow -4 \times -5$

$\Rightarrow 20$

iv) $\frac{-27}{343} = \frac{-3}{7}$

v) $\frac{729}{-1331} = \frac{9}{-11}$

vi) $250.047 = 6.3$

$26244 = 3 \times 3 \times 3 \times 3 \times 3 \times 3 \times 3 \times 3 \times 2 \times 2$

$\Rightarrow 3 \times 3 \times 2 \times 2$

$= 36$ Ans

$30375 = 3 \times 3 \times 3 \times 3 \times 3 \times 5 \times 5 \times 5$

$\Rightarrow (3 \times 3) \times 3$

$\Rightarrow 3$ Ans

2	26244
2	13122
3	6561
3	2187
3	729
3	243
3	81
3	27
3	9
3	3
	1

3	30375
3	10125
3	3375
3	1125
3	375
5	125
5	25
5	5
	1