Exercise 4C

2	216
2	108
2	54
3	27
3	9
3	3
	1

$216 = 2 \times 2 \times 2 \times 3 \times 3 \times 3$

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

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

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

Q10

Answer :

$\sqrt[3]{-512}$

By prime factorisation:

2	512
2	256
2	128
2	64
2	32
2	16
2	8
2	4
2	2
	1

$$\sqrt[3]{512} = 2\times2\times2\times2\times2\times2\times2\times2\times2$$
$$= (2\times2\times2)\times(2\times2\times2)\times(2\times2\times2)$$
$$\sqrt[3]{-512} = -\sqrt[3]{(2\times2\times2)} = -8$$

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

Q11

Answer :

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

By prime factorisation:

$$\sqrt[3]{1331} = \sqrt[3]{11\times11\times11}$$

11	1331
11	121
11	11
	1

$$\sqrt[3]{-1331} = -(11\times11\times11)^{\frac{1}{3}} = -11$$
$$\therefore \sqrt[3]{-1331} = -\left(\sqrt[3]{1331}\right) = -11$$

Q12

Answer :

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

By prime factorisation:

3	27
3	9
3	3
	1

2	64
2	32
2	16
2	8
2	4
2	2
	1

$$\sqrt[3]{\frac{27}{64}} = \frac{\sqrt[3]{27}}{\sqrt[3]{64}} = \frac{\sqrt[3]{(3\times3\times3)}}{\sqrt[3]{(2\times2\times2)\times(2\times2\times2)}} = \frac{\sqrt[3]{(3\times3\times3)}}{\sqrt[3]{(4\times4\times4)}} = \frac{3}{4}$$

$$\therefore \sqrt[3]{\frac{27}{64}} = \frac{3}{4}$$

Q13

Answer :

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

By prime factorisation:

5	125
5	25
5	5
	1

2	216
2	108
2	54
3	27
3	9
3	3
	1

$$\sqrt[3]{\frac{125}{216}} = \frac{\sqrt[3]{5\times5\times5}}{\sqrt[3]{(2\times2\times2)\times(3\times3\times3)}} = \frac{\sqrt[3]{5\times5\times5}}{\sqrt[3]{(6\times6\times6)}} = \frac{5}{6}$$

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

Q14

Answer :

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

3	27
3	9
3	3
	1

5	125
5	25
5	5
	1

By factorisation:

$$\sqrt[3]{\frac{27}{125}} = \sqrt[3]{\frac{3\times3\times3}{5\times5\times5}}$$

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

Q15

Answer :

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

On factorisation:

2	64
2	32

7	343

2	16
2	8
2	4
2	2
	1

7	343
7	49
7	7
	1

$\sqrt[3]{\frac{64}{343}} = \sqrt[3]{\frac{2\times2\times2\times2\times2\times2}{7\times7\times7}}$

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

Q16

Answer :

$\sqrt[3]{64 \times 729}$

$\sqrt[3]{64 \times 729} = \sqrt[3]{64} \times \sqrt[3]{729}$

$= \sqrt[3]{4 \times 4 \times 4} \times \sqrt[3]{(3 \times 3 \times 3) \times (3 \times 3 \times 3)}$

$= \sqrt[3]{4 \times 4 \times 4} \times \sqrt[3]{(9 \times 9 \times 9)}$

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

Q17

Answer :

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

3	729
3	243
3	81
3	27
3	9
3	3
	1

2	1000
2	500
2	250
5	125
5	25
5	5
	1

On factorisation:

$\sqrt[3]{\frac{729}{1000}} = \frac{\sqrt[3]{(3\times3\times3)\times(3\times3\times3)}}{\sqrt[3]{(2\times2\times2)\times(5\times5\times5)}} = \frac{\sqrt[3]{9\times9\times9}}{\sqrt[3]{10\times10\times10}}$

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

Q18

Answer :

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

By factorisation:

2	512
2	256
2	128

2	64
2	32
2	16
2	8
2	4
2	2
	1

7	343
7	49
7	7
	1

$$\sqrt[3]{\frac{512}{343}} \quad \frac{\sqrt[3]{8\times8\times8}}{\sqrt[3]{7\times7\times7}}$$

$$\sqrt[3]{\frac{-512}{343}} \quad \frac{-8}{7}$$

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