Cubes and Cubes Roots Ex 4.4 Q1

Answer :

(i)
We have:

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

(ii)
We have:

$$\sqrt[3]{-5832} = -\sqrt[3]{5832}$$

To find the cube root of 5832, we use the method of unit digits.

Let us consider the number 5832.
The unit digit is 2; therefore the unit digit in the cube root of 5832 will be 8.
After striking out the units, tens and hundreds digits of the given number, we are left with 5.
Now, 1 is the largest number whose cube is less than or equal to 5.
Therefore, the tens digit of the cube root of 5832 is 1.

$$\therefore \sqrt[3]{5832} = 18$$

$$\Rightarrow \sqrt[3]{-5832} = -\sqrt[3]{5832} = -18$$

(iii)
We have:

$$\sqrt[3]{-2744000} = -\sqrt[3]{2744000}$$

To find the cube root of 2744000, we use the method of factorisation.

On factorising 2744000 into prime factors, we get:
$$2744000 = 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 5 \times 5 \times 5 \times 7 \times 7 \times 7$$
On grouping the factors in triples of equal factors, we get:
$$2744000 = \{2 \times 2 \times 2\} \times \{2 \times 2 \times 2\} \times \{5 \times 5 \times 5\} \times \{7 \times 7 \times 7\}$$
It is evident that the prime factors of 2744000 can be grouped into triples of equal factors and no factor is left over.

Now, collect one factor from each triplet and multiply; we get:
$$2 \times 2 \times 5 \times 7 = 140$$
This implies that 2744000 is a cube of 140.

Hence, $\sqrt[3]{-2744000} = -\sqrt[3]{2744000} = -140$

(iv)
We have:

$\sqrt[3]{-753571} = -\sqrt[3]{753571}$

To find the cube root of 753571, we use the method of unit digits.

Let us consider the number 753571.
The unit digit is 1; therefore the unit digit in the cube root of 753571 will be 1.
After striking out the units, tens and hundreds digits of the given number, we are left with 753.
Now, 9 is the largest number whose cube is less than or equal to 753 ($9^3 < 753 < 10^3$).
Therefore, the tens digit of the cube root 753571 is 9.

$\therefore \sqrt[3]{753571} = 91$

$\Rightarrow \sqrt[3]{-753571} = -\sqrt[3]{753571} = -91$

(v)
We have:

$\sqrt[3]{-32768} = -\sqrt[3]{32768}$

To find the cube root of 32768, we use the method of unit digits.

Let us consider the number 32768.
The unit digit is 8; therefore, the unit digit in the cube root of 32768 will be 2.
After striking out the units, tens and hundreds digits of the given number, we are left with 32.
Now, 3 is the largest number whose cube is less than or equal to 32 ($3^3 < 32 < 4^3$).
Therefore, the tens digit of the cube root 32768 is 3.

$\therefore \sqrt[3]{32768} = 32$

$\Rightarrow \sqrt[3]{-32768} = -\sqrt[3]{32768} = -32$

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