Cubes and Cubes Roots Ex 4.2 Q3

Answer :

In order to check if a negative number is a perfect cube, first check if the corresponding positive integer is a perfect cube. Also, for any positive integer m, $-m^3$ is the cube of $-m$.

(i)

On factorising 5832 into prime factors, we get:

$5832 = 2 \times 2 \times 2 \times 3 \times 3 \times 3 \times 3 \times 3 \times 3$

On grouping the factors in triples of equal factors, we get:

$5832 = \{2 \times 2 \times 2\} \times \{3 \times 3 \times 3\} \times \{3 \times 3 \times 3\}$

It is evident that the prime factors of 5832 can be grouped into triples of equal factors and no factor is left over. Therefore, 5832 is a perfect cube. This implies that -5832 is also a perfect cube.

Now, collect one factor from each triplet and multiply, we get:

$2 \times 3 \times 3 = 18$

This implies that 5832 is a cube of 18.

Thus, -5832 is the cube of -18.

(ii)

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. Therefore, 2744000 is a perfect cube. This implies that -2744000 is also a perfect cube.

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.

Thus, -2744000 is the cube of -140.

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