Cubes and Cubes Roots Ex 4.1 Q20

Answer :

(i)
On factorising 64 into prime factors, we get:
$$64 = 2 \times 2 \times 2 \times 2 \times 2 \times 2$$

On grouping the factors in triples of equal factors, we get:
$$64 = \{2 \times 2 \times 2\} \times \{2 \times 2 \times 2\}$$
It is evident that the prime factors of 64 can be grouped into triples of equal factors and no factor is left over. Therefore, 64 is a perfect cube.

(ii)
On factorising 216 into prime factors, we get:
$$216 = 2 \times 2 \times 2 \times 3 \times 3 \times 3$$

On grouping the factors in triples of equal factors, we get:
$$216 = \{2 \times 2 \times 2\} \times \{3 \times 3 \times 3\}$$

It is evident that the prime factors of 216 can be grouped into triples of equal factors and no factor is left over. Therefore, 216 is a perfect cube.

(iii)
On factorising 243 into prime factors, we get:
$$243 = 3 \times 3 \times 3 \times 3 \times 3$$

On grouping the factors in triples of equal factors, we get:
$$243 = \{3 \times 3 \times 3\} \times 3 \times 3$$

It is evident that the prime factors of 243 cannot be grouped into triples of equal factors such that no factor is left over. Therefore, 243 is a not perfect cube.

(iv)
On factorising 1728 into prime factors, we get:
$$1728 = 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 3 \times 3 \times 3$$

On grouping the factors in triples of equal factors, we get:
$$1728 = \{2 \times 2 \times 2\} \times \{2 \times 2 \times 2\} \times \{3 \times 3 \times 3\}$$

It is evident that the prime factors of 1728 can be grouped into triples of equal factors and no factor is left over. Therefore, 1728 is a perfect cube.

Thus, (iii) 243 is the required number, which is not a perfect cube.

Cubes and Cubes Roots Ex 4.1 Q21

Answer :

The only non-perfect cube in question number 20 is 243.

(a)
On factorising 243 into prime factors, we get:
$243 = 3 \times 3 \times 3 \times 3 \times 3$

On grouping the factors in triples of equal factors, we get:
$243 = \{3 \times 3 \times 3\} \times 3 \times 3$

It is evident that the prime factors of 243 cannot be grouped into triples of equal factors such that no factor is left over. Therefore, 243 is not a perfect cube. However, if the number is multiplied by 3, the factors can be grouped into triples of equal factors such that no factor is left over.

Thus, 243 should be multiplied by 3 to make it a perfect cube.

(b)
On factorising 243 into prime factors, we get:
$243 = 3 \times 3 \times 3 \times 3 \times 3$

On grouping the factors in triples of equal factors, we get:
$243 = \{3 \times 3 \times 3\} \times 3 \times 3$

It is evident that the prime factors of 243 cannot be grouped into triples of equal factors such that no factor is left over. Therefore, 243 is not a perfect cube. However, if the number is divided by
$(3 \times 3 = 9)$, the factors can be grouped into triples of equal factors such that no factor is left over.

Thus, 243 should be divided by 9 to make it a perfect cube.

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