



Cubes and Cubes Roots Ex 4.2 Q1

Answer :

(i)

Cube of -11 is given as:

$$(-11)^3 = -11 \times -11 \times -11 = -1331$$

Thus, the cube of 11 is (-1331) .

(ii)

Cube of -12 is given as:

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

Thus, the cube of -12 is (-1728) .

(iii)

Cube of -21 is given as:

$$(-21)^3 = -21 \times -21 \times -21 = -9261$$

Thus, the cube of -21 is (-9261) .

Cubes and Cubes Roots Ex 4.2 Q2

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 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. This implies that -64 is also a perfect cube.

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

$$2 \times 2 = 4$$

This implies that 64 is a cube of 4 .

Thus, -64 is the cube of -4 .

(ii)

On factorising 1056 into prime factors, we get:

$$1056 = 2 \times 2 \times 2 \times 2 \times 2 \times 3 \times 11$$

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

$$1056 = \{2 \times 2 \times 2\} \times 2 \times 2 \times 3 \times 11$$

$$1056 = \{2 \times 2 \times 2\} \times 2 \times 2 \times 3 \times 11$$

It is evident that the prime factors of 1056 cannot be grouped into triples of equal factors such that no factor is left over. Therefore, 1056 is not a perfect cube. This implies that -1056 is not a perfect cube as well.

(iii)

On factorising 2197 into prime factors, we get:

$$2197 = 13 \times 13 \times 13$$

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

$$2197 = \{13 \times 13 \times 13\}$$

It is evident that the prime factors of 2197 can be grouped into triples of equal factors and no factor is left over. Therefore, 2197 is a perfect cube. This implies that -2197 is also a perfect cube.

Now, collect one factor from each triplet and multiply, we get 13.

This implies that 2197 is a cube of 13.

Thus, -2197 is the cube of -13 .

(iv)

On factorising 2744 into prime factors, we get:

$$2744 = 2 \times 2 \times 2 \times 7 \times 7 \times 7$$

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

$$2744 = \{2 \times 2 \times 2\} \times \{7 \times 7 \times 7\}$$

It is evident that the prime factors of 2744 can be grouped into triples of equal factors and no factor is left over. Therefore, 2744 is a perfect cube. This implies that -2744 is also a perfect cube.

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

$$2 \times 7 = 14$$

This implies that 2744 is a cube of 14.

Thus, -2744 is the cube of -14 .

(v)

On factorising 42875 into prime factors, we get:

$$42875 = 5 \times 5 \times 5 \times 7 \times 7 \times 7$$

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

$$42875 = \{5 \times 5 \times 5\} \times \{7 \times 7 \times 7\}$$

It is evident that the prime factors of 42875 can be grouped into triples of equal factors and no factor is left over. Therefore, 42875 is a perfect cube. This implies that -42875 is also a perfect cube.

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

$$5 \times 7 = 35$$

This implies that 42875 is a cube of 35.

Thus, -42875 is the cube of -35 .

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