

CHAPTER 07**Cubes and Cube Roots****Solved Examples:****Q1.**Find the smallest prime number dividing the sum $3^{11} + 5^{13}$.**Sol.**

Given,

The sum of $3^{11} + 5^{13}$.

We have to find out smallest prime number,

$$3^{11} = \text{Odd number}$$

$$5^{13} = \text{Odd number}$$

$$\therefore 3^{11} + 5^{13} = \text{odd number} + \text{odd number} = \text{even number}$$

So, every even number is divisible by '2'.

Hence, the sum of $3^{11} + 5^{13}$ is divisible by 2, which is the smallest prime number.

Q2.

Ravi made a cuboid of plasticine of dimensions 12cm, 8 cm and 3 cm. How many minimum numbers of such cuboids will be needed to form a cube?

Sol.

Given, $12 \times 8 \times 3$.

The above prime factors 12, 8 and 3 are in triple.

Therefore, the number must be multiplied by,

$12 \times 12 \times 8 \times 8 \times 3 \times 3 = 288$ to make it a perfect cube.

Hence, Ravi needs 288 cuboids.

Q3. Three numbers are to one another $2 : 3 : 4$. The sum of their cubes is 33957. Find the numbers.

Sol.

Let the numbers are $2x$, $3x$ and $4x$. Then,

\therefore Sum of their cubes is 33957

$$\Rightarrow (2x)^3 + (3x)^3 + (4x)^3 = 33957$$

$$\Rightarrow 8x^3 + 27x^3 + 64x^3 = 33957$$

$$\Rightarrow 99x^3 = 33957$$

$$\Rightarrow x^3 = \frac{33957}{99} = 343$$

$$\Rightarrow x^3 = 343 = 7 \times 7 \times 7 \quad (\because \text{Resolving into prime factors})$$

$$\Rightarrow x = \sqrt[3]{343} = \sqrt[3]{7 \times 7 \times 7} = 7$$

Hence, the numbers are $2x = 2(7) = 14$

$$3x = 3 (7) = 21$$

$$4x = 4 (7) = 28$$

