

## SQUARE ROOT AND CUBE ROOT

<b>Square Root</b>	If $x^2 = y$ , we say that the square root of $y$ is $x$ and we write $y = x^2$ . Thus $4 = 2^2$ , $9 = 3^2$ , $196 = 14^2$ .
<b>Cube Root</b>	The cube root of a given number $x$ is the number whose cube is $x$ . We, denote the cube root of $x$ by $\sqrt[3]{x}$ . Thus, $8 = 2 \times 2 \times 2 = 2^3$ , $343 = 7 \times 7 \times 7 = 7^3$ etc.

### NOTE

- $x \times y = x \times y$
- $x \div y = x \div y = (x \div y) \times (y \div y) = x \times y \div y$

### Problems with solutions

1. The least perfect square, which is divisible by each of 21, 36 and 66 is:

#### Solution

L.C.M. of 21, 36, 66 = 2772.

Now,  $2772 = 2 \times 2 \times 3 \times 3 \times 7 \times 11$

To make it a perfect square, it must be multiplied by  $7 \times 11$ .

So, required number =  $2^2 \times 3^2 \times 7^2 \times 11^2 = 213444$

2. A group of students decided to collect as many paise from each member of group as is the number of members. If the total collection amounts to Rs. 59.29, the number of the member is the group is:

#### Solution

Money collected =  $(59.29 \times 100)$  paise = 5929 paise.

Number of members =  $\sqrt{5929} = 77$ .

3. How many two-digit numbers satisfy this property.: The last digit (unit's digit) of the square of the two-digit number is 8 ?

#### Solution

A number ending in 8 can never be a perfect square.

4. The square root of 64009 is:

#### Solution

$\sqrt{64009} = 253$

$$\begin{array}{r}
 |4 \\
 |----- \\
 45|240 \\
 |225 \\
 |----- \\
 503| 1509 \\
 | 1509 \\
 |----- \\
 | \quad X \\
 |----- \\
 \therefore 64009 = 253.
 \end{array}$$

5. The cube root of .000216 is:

**Solution**

$$\begin{aligned}
 (.000216)^{1/3} &= \left(\frac{216}{10^6}\right)^{1/3} \\
 &= \left(\frac{6 \times 6 \times 6}{10^2 \times 10^2 \times 10^2}\right)^{1/3} \\
 &= \frac{6}{10^2} \\
 &= \frac{6}{100} \\
 &= 0.06
 \end{aligned}$$