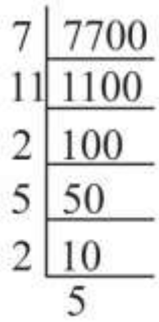
Assignment – 1

Real Numbers

1. Give the prime factorization of 7700.

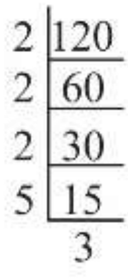
Solution:

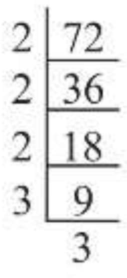


$\therefore \quad 7700 = 2 \times 2 \times 5 \times 5 \times 7 \times 11$

2. Find the HCF and LCM of 72 and 120.

Solution:





$72 = 2^3 \times 3^2$

$120 = 2^3 \times 3 \times 5$

HCF $= 2^3 \times 3 = 24$

LCM $= 2^3 \times 3^2 \times 5 = 360$

3. Find the HCF and LCM of 15, 21, 24.

Solution:

$15 = 3 \times 5$

$21 = 3 \times 7$

$24 = 3 \times 2 \times 2 \times 2$

$\therefore$ HCF $= 3$

$\therefore$ LCM $= 3 \times 2 \times 2 \times 2 \times 5 \times 7 = 840$

4. Given $\sqrt{2}$ is irrational. Prove $3 + 3\sqrt{2}$ is an irrational number.

Solution:

Let $3 + 3\sqrt{2}$ be a rational number.

Such that $3 + 3\sqrt{2} = \frac{p}{q}$

Where in $\frac{p}{q}$

p and q are co - primes $q \neq 0$

$$\Rightarrow \quad 3\sqrt{2} = \frac{p}{q} - 3 = \frac{p-3q}{q}$$

$$\Rightarrow \quad \sqrt{2} = \frac{p-3q}{3q}$$

Since p and q are integers $p - 3q$ is an integer, $3q$ is an integer $\frac{p-3q}{3q}$ is a rational number.

On LHS we have $\sqrt{2}$ a irrational number.

On RHS we have a rational number.

This is a contradiction.

$\therefore\ 3 + 3\sqrt{2}$ is a irrational number.