CLASS 10 · MATHEMATICS · CHAPTER 1

Real Numbers - NCERT Examples

Examples 1-7 with independently verified solutions.

CHAPTER	RESOURCE	SOURCE
Real Numbers	NCERT Examples	NCERT Mathematics, Reprint 2026-27

PART 1

Verified NCERT questions and solutions

Verified NCERT questions and solutions

Solutions are checked independently and follow the supplied NCERT chapter edition.

NCERT EXAMPLE

Example 1

prime factorisation · terminal digit

Consider the numbers 4^n, where n is a natural number. Check whether there is any value of n for which 4^n ends with the digit zero.

Solution

$$4^n = (2^2)^n = 2^{2n}$$

A number ending in zero is divisible by 10 = 2 × 5, so its prime factorisation contains both 2 and 5. The factorisation of 4^n contains only 2 and has no factor 5.

Final answer

There is no natural number n for which 4^n ends with zero.

NCERT EXAMPLE

Example 2

HCF · LCM · prime factorisation

Find the LCM and HCF of 6 and 20 by the prime factorisation method.

Solution

$$6 = 2 \times 3, \qquad 20 = 2^2 \times 5$$

$$\mathrm{HCF}(6, 20) = 2$$

$$\mathrm{LCM}(6, 20) = 2^2 \times 3 \times 5 = 60$$

Final answer

HCF = 2 and LCM = 60.

NCERT EXAMPLE

Example 3

HCF · LCM · prime factorisation

Find the HCF of 96 and 404 by the prime factorisation method. Hence, find their LCM.

Solution

$$96 = 2^5 \times 3, \qquad 404 = 2^2 \times 101$$

$$\mathrm{HCF}(96, 404) = 2^2 = 4$$

$$\text{LCM}(96, 404) = \frac{96 \times 404}{4} = 9696$$

Final answer

HCF = 4 and LCM = 9696.

NCERT EXAMPLE

Example 4

HCF · LCM · prime factorisation

Find the HCF and LCM of 6, 72 and 120, using the prime factorisation method.

Solution

$$6 = 2 \times 3, \quad 72 = 2^3 \times 3^2, \quad 120 = 2^3 \times 3 \times 5$$

$$\text{HCF} = 2 \times 3 = 6$$

$$\text{LCM} = 2^3 \times 3^2 \times 5 = 360$$

Final answer

HCF = 6 and LCM = 360.

NCERT EXAMPLE

Example 5

irrational numbers · proof by contradiction

Prove that $\sqrt{3}$ is irrational.

Solution

Suppose √3 is rational and write it in lowest terms.

$$\sqrt{3} = \frac{p}{q}, \qquad \gcd(p, q) = 1, \quad q \neq 0$$

$$p^2 = 3q^2$$

Thus 3 divides p², so 3 divides p. Put p = 3k. Substitution gives q² = 3k², so 3 also divides q. This contradicts p and q being coprime.

Final answer

Therefore, √3 is irrational.

NCERT EXAMPLE

Example 6

irrational numbers · proof by contradiction

Show that 5 − √3 is irrational.

Solution

Suppose 5 − √3 = r for a rational number r.

$$\sqrt{3} = 5 - r$$

The right side would be rational, contradicting the irrationality of √3.

Final answer

Therefore, 5 − √3 is irrational.

NCERT EXAMPLE

Example 7

irrational numbers · proof by contradiction

Show that $3\sqrt{2}$ is irrational.

Solution

Suppose $3\sqrt{2}$ = r for a rational number r.

$$\sqrt{2} = \frac{r}{3}$$

The right side would be rational, contradicting the irrationality of $\sqrt{2}$.

Final answer

Therefore, $3\sqrt{2}$ is irrational.