Real Numbers

Start by writing each positive integer as a product of primes. The smallest exponent shared by two numbers gives the HCF; the largest exponent present gives the LCM.

Formulas and methods

Every integer greater than 1 has a prime factorisation unique apart from the order of its prime factors. The number 1 is neither prime nor composite.

For two positive integers a and b: HCF(a,b) × LCM(a,b) = ab. This product rule is not a general rule for three integers.

To prove irrationality, assume the number is p/q in lowest terms, square if needed, and show that p and q share a prime factor.

Worked examples

Find the HCF and LCM of 84 and 126.

$84 = 2^2 \times 3 \times 7$; $126 = 2 \times 3^2 \times 7$. Therefore HCF $= 2 \times 3 \times 7 = 42$ and LCM $= 2^2 \times 3^2 \times 7 = 252$. Check: $42 \times 252 = 84 \times 126 = 10584$.

Why is √3 irrational?

Suppose $\sqrt{3} = p/q$, with coprime integers p,q and $q \neq 0$. Then $p^2 = 3q^2$, so 3 divides p. Write $p = 3k$. This gives $q^2 = 3k^2$, so 3 also divides q. That contradicts coprimality; √3 is irrational.

Common mistake

Do not call every non-integer irrational: 7/4 is rational. In an irrationality proof, state that the fraction is in lowest terms.

Real Numbers — practice

Try these without looking at the answers. Show substitutions and units. Difficulty labels describe these questions, not official CBSE classifications.

1. [Foundation] Find the HCF and LCM of 36 and 60.

2. [Core] Two positive integers have HCF 8 and product 1536. Find their LCM.

3. [Core] Find the greatest number that divides 96 and 144 exactly.

4. [Challenge] Prove that $3 + 2\sqrt{5}$ is irrational, given that $\sqrt{5}$ is irrational.

Real Numbers — answers

1. Find the HCF and LCM of 36 and 60.

36 = $2^2 \times 3^2$ and 60 = $2^2 \times 3 \times 5$. HCF = 12; LCM = 180.

2. Two positive integers have HCF 8 and product 1536. Find their LCM.

LCM = 1536/8 = 192.

3. Find the greatest number that divides 96 and 144 exactly.

HCF(96,144) = 48.

4. Prove that $3 + 2\sqrt{5}$ is irrational, given that $\sqrt{5}$ is irrational.

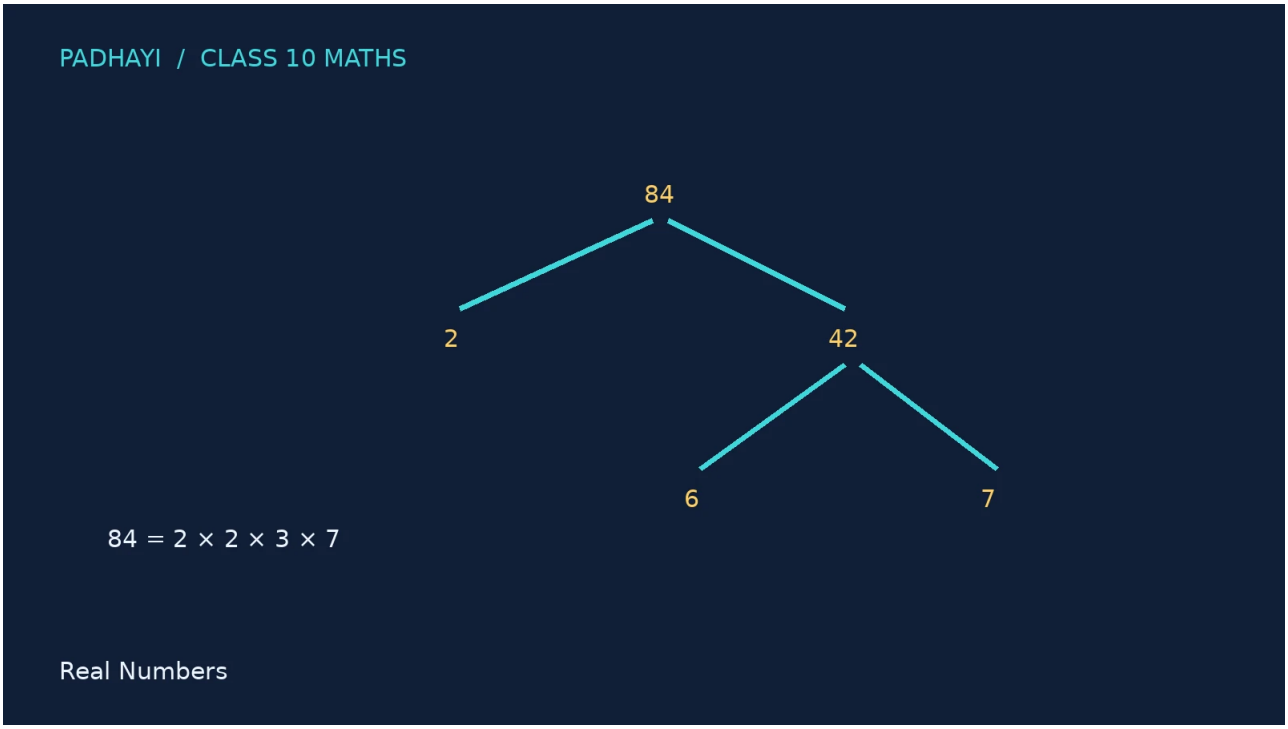
If $3 + 2\sqrt{5} = r$ were rational, then $\sqrt{5} = (r - 3)/2$ would be rational, a contradiction.

Next step: explain one method aloud, then solve a question from your NCERT textbook without using this sheet.

Original Padhayi revision material. Independent study aid; not an official CBSE or NCERT publication. Syllabus reference: CBSE Mathematics, Class X, 2026–27.

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Visual reminder



Schematic illustration; diagrams are not necessarily drawn to scale.