Finding HCF by Prime Factorisation

Understanding HCF by Prime Factorisation

- HCF (Highest Common Factor) is the greatest number that divides two or more numbers exactly.
- We can find HCF by using the prime factorisation method.
- In this method, we break each number into prime factors.
- Then we take only the common prime factors.
- Multiply those common factors to get the HCF.

Steps to Find HCF by Prime Factorisation

- **Step 1:** Find the prime factors of each number
- **Step 2:** Identify the common prime factors
- **Step 3:** Multiply the common factors to get the HCF

Examples with Solutions

Example: Find HCF of 12 and 18

$12 = 2 \times 2 \times 3$

$18 = 2 \times 3 \times 3$

Common prime factors = 2×3

HCF = 6

Example: Find HCF of 20 and 30

$20 = 2 \times 2 \times 5$

$30 = 2 \times 3 \times 5$

Common prime factors = 2×5

HCF = 10

Example: Find HCF of 8 and 12

$8 = 2 \times 2 \times 2$

$12 = 2 \times 2 \times 3$

Common prime factors = 2×2

HCF = 4

Example: Find HCF of 9 and 15

9 = 3 × 3

15 = 3 × 5

Common prime factor = 3

HCF = 3

Example: Find HCF of 14 and 21

14 = 2 × 7

21 = 3 × 7

Common prime factor = 7

HCF = 7

Summary Points

- HCF is the greatest number that divides all given numbers without a remainder.
- Prime factorisation helps break numbers into their prime building blocks.
- Take only common prime factors to find HCF.
- Multiply the common prime factors to get the final HCF.
- This method is accurate and useful for larger numbers.