Prime Factors

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Prime factors are the prime numbers that multiply together to form a given number. Prime factors are found using prime factorization.

1. Find to Prime Factors:

There are two methods to find prime factors:

A. Factor Tree Method

Break the number into factors until only prime numbers remain.

Example: Find prime factors of 36

- Prime factors of $36 = 2 \times 2 \times 3 \times 3$
- Written as: $2^2 \times 3^2$

B. Division Method

- i. Divide the number by the smallest prime number (2, 3, 5, etc.).
- ii. Keep dividing until you get 1.

Example: Find prime factors of 60

- 60 ÷ 2 = 30
- 30 ÷ 2 = 15
- 15 ÷ 3 = 5
- 5 is prime

Prime factorization of $60 = 2 \times 2 \times 3 \times 5$

2. Properties of Prime Factors

- i. Prime factors are always prime numbers.
- ii. Every number has a unique set of prime factors.
- iii. Prime factorization helps in finding LCM and HCF.
- iv. A composite number can always be expressed as a product of prime factors.

3. Prime Factors Importance:

- i. Helps in simplifying fractions.
- ii. Used in finding LCM and HCF.
- iii. Essential in cryptography and coding.