



## Introduction to Prime Time

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Prime Time refers to the study of prime numbers, composite numbers, and their properties.

Prime numbers play an important role in number theory and real-life applications like cryptography and coding.

### 1. Prime and Composite Numbers

#### A. Prime Numbers

A prime number is a number that has only two factors: 1 and itself.

**Example:** 2, 3, 5, 7, 11, 13, 17, 19, ...

- **Smallest prime number** = 2 (It is also the only even prime number).

#### B. Composite Numbers

A composite number has more than two factors.

**Example:** 4, 6, 8, 9, 10, 12, 14, 15, ...

**Example Explanation:**

- 6 is composite because it has factors 1, 2, 3, and 6.

#### C. Special Case: 1 is Not Prime or Composite

1 has only one factor (itself), so it is neither prime nor composite.

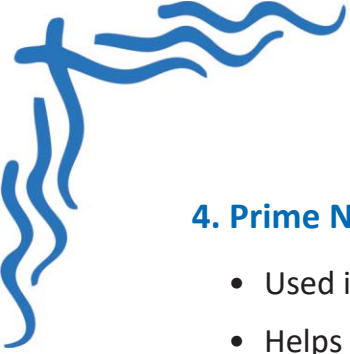
### 2. Prime Factorization

Prime factorization is writing a number as a product of prime numbers.

**Example:**  $24 = 2 \times 2 \times 2 \times 3$

### 3. Properties of Prime Numbers

- Every prime number is greater than 1.
- 2 is the only even prime number.
- All prime numbers (except 2) are odd.
- Every composite number can be expressed as a product of prime numbers.
- There are infinitely many prime numbers.



#### 4. Prime Numbers Importance

- Used in encryption and security systems (like passwords and banking).
- Helps in understanding factors and multiples.
- Forms the base of higher mathematical concepts.