

Prime Numbers

Prime Numbers and Composite Numbers

(i) Prime Numbers

Numbers that have **only** two different factors, 1 and itself.
2, 3, 5, 7, 11, 13, 17, 19, 23, 29, ... are prime numbers.

(ii) Composite Numbers

Numbers that have **more than** two different factors.
4, 6, 8, 10, 12, 14, 15, 16, 18, ... are composite numbers.



Tips

The number 1 is neither a prime number nor a composite number.
The number 2 is the only prime number that is an even number.

Prime Factorisation and Index Notation

(i) Prime Factorisation

It is a process of expressing a composite number as the product of prime factors.

(ii) Index Notation

$a \times a \times a \times \dots \times a$ can be written as a^n .
└──────────┘
n factors

Example

1

A prime number is more than 40 but less than 50. What is the greatest possible prime number within this range?

Solution: The possible prime numbers that lie between 40 and 50 are 41, 43 and 47. Thus, the greatest possible prime number is 47.

Example

2

A number W lies between 60 and 70. The sum of its digits is an even number. Is W a prime number or a composite number?

Solution: $W =$

6	?
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even + even \Rightarrow sum of its digits is an even number

W is an even number and thus it is a composite number.

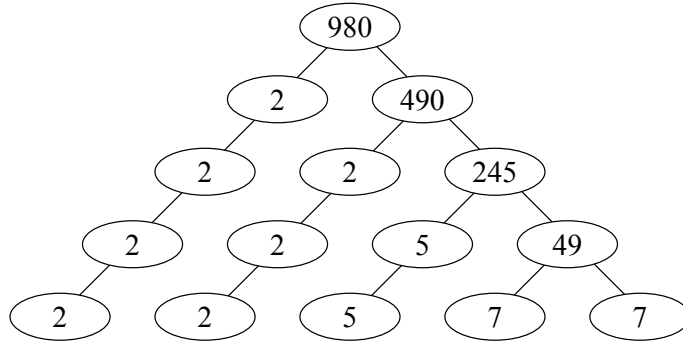
Example

3

Express 980 using index notation.

Solution:

Method 1
(Factor tree)



Method 2
(Prime factorisation)

$$\begin{array}{r} 2 \overline{)980} \\ 2 \overline{)490} \\ 5 \overline{)245} \\ 7 \overline{)49} \\ 7 \overline{)7} \\ \hline 1 \end{array}$$

$$980 = 2^2 \times 5 \times 7^2$$

Adapted:

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