

## Prime Factorisation using the Factor Tree Method

### Table of Contents

- Factor Tree Approach
- Exponential Form
- Summary
- What's Next?

In the previous segment, we were introduced to **Euclid's Division Algorithm**. In this segment, we will understand prime factorisation using the Factor tree method.

### What is the Factor tree approach?

The Factor tree approach is a technique for prime factorisation of a number.

Prime factorisation of a number is expressing the number as a product of its prime factors.

For example,

Prime factorisation of 36 means writing 36 as a product of its prime factors.

#### Method 1:

Here,

$$\begin{aligned}36 &= 2 \times 18 \\ &= 2 \times 2 \times 9 \\ &= 2 \times 2 \times 3 \times 3\end{aligned}$$

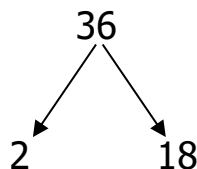
So, the prime factorisation of 36 is  $2 \times 2 \times 3 \times 3$ .

#### Method 2:

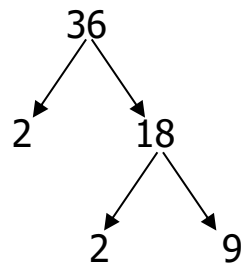
The prime factors of 36 can also be obtained using the factor tree.

In this method, the number to be factored is written at the top.

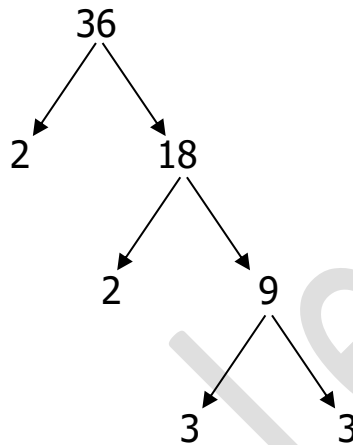
$36 = 2 \times 18$ . So, 2 and 18 are written below 36 as shown.



As 18 isn't a prime number, it can be broken down as  $18 = 2 \times 9$ .



As 9 isn't a prime number, it can be broken down as  $9 = 3 \times 3$ .



**Factor tree**

Now there are only prime numbers in the branches. Hence, the factor tree is complete. 36 can thus be expressed as  $36 = 2 \times 2 \times 3 \times 3$ .

### What is Exponential form of writing prime factors?

36 can also be written as,

$$36 = 2^2 \times 3^2$$

This is the exponential form of writing the prime factors.

### Summary

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### What's next?

In the next segment of **Class 10 Maths**, we look at some more **examples of the factor tree method**.