SESSION	**: 9**
CLASS	**: IV**
SUBJECT	**: MATHEMATICS**
CHAPTER NUMBER	**: 10**
CHAPTER NAME	**: FACTORS AND MULTIPLES**
SUBTOPIC	**: PRIME FACTORS AND FACTORIZATION**

LEARNING OBJECTIVE

- **Enable the students to understand the concept of prime factors and how to use the prime factors in the process of prime factorization.**

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PRIME FACTORS

A prime factor of a given number is a prime number that completely divides the given number.

Prime factors can be obtained by using **2** methods :

(1) **Factor tree method**

(2) **Prime factorization method**

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PRIME FACTORS

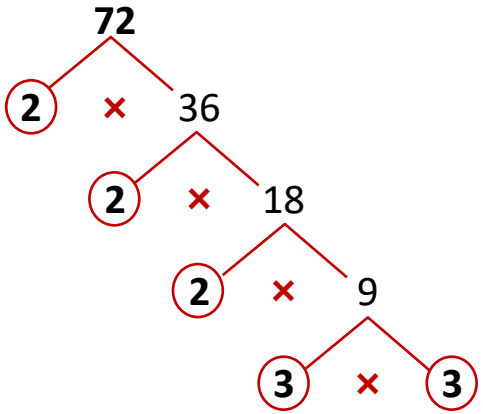
(1) Factor tree method

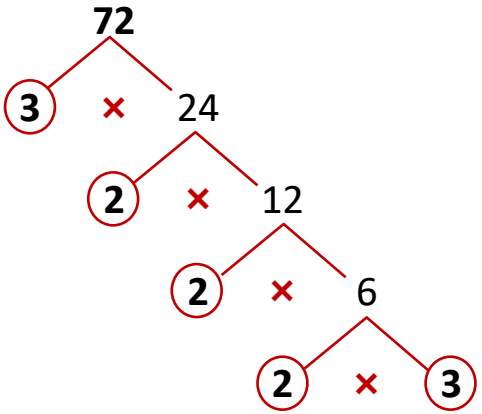
In factor tree method, we keep on breaking a number into **factors** until we get all **prime factors**. These **prime factors** are circled and written in the end to represent the number as their product.

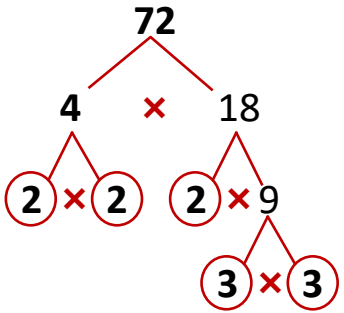
PRIME FACTORS

Example : 1

Find the prime factors of 72 using factor tree method.







Similarly, we can make factor trees of **96** by expressing **96** as a product of **6 × 12** and **8 × 9** but we will get the same prime factors.

So, 72 can be expressed as a product of its prime factors as follows :

72 = 2 × 2 × 2 × 3 × 3

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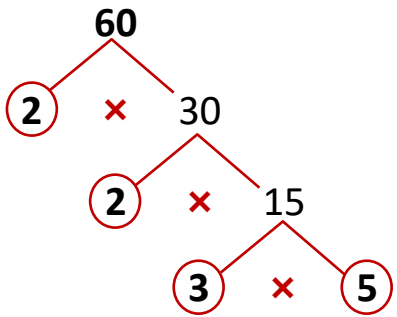
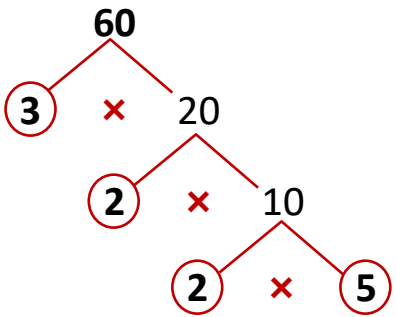
PRIME FACTORS

Example : 2

Find the prime factors of 60 using factor tree method.





60 can be expressed as a product of its prime factors as follows :

60 = 2 × 2 × 3 × 5

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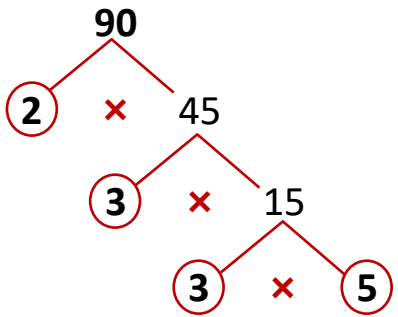
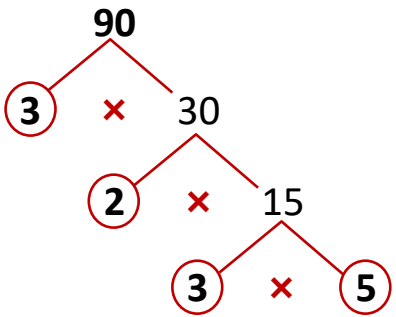
PRIME FACTORS

Example : 3

Find the prime factors of 90 using factor tree method.





90 can be expressed as a product of its prime factors as follows :

90 = 2 × 3 × 3 × 5

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PRIME FACTORS

(2) Prime factorization method

In this method we start dividing the number with its smallest prime factor and keep on dividing till we get 1 as a quotient. As it is difficult to make factor trees for larger numbers, this method is more useful and compact.

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PRIME FACTORS

Example : 1

Find the prime factors of 396 using prime factorization.

2	396
2	198
3	99
3	33
11	11
	1

396 ÷ 2 = 198

198 ÷ 2 = 99

99 ÷ 3 = 33

33 ÷ 3 = 11

11 ÷ 11 = 1 ← Quotient

∴ 396 = 2 × 2 × 3 × 3 × 11

Note : Every composite number can be expressed as a product of all its prime factors.

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PRIME FACTORS

Example : 2

Find the prime factors of 234 using prime factorization.

2	234
3	117
3	39
13	13
	1

234 ÷ 2 = 117

117 ÷ 3 = 39

39 ÷ 3 = 13

13 ÷ 13 = 1 ← Quotient

∴ 234 = 2 × 3 × 3 × 13

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PRIME FACTORS

Example : 3

Find the prime factors of 126 using prime factorization.

2	126
3	63
3	21
7	7
	1

126 ÷ 2 = 63

63 ÷ 3 = 21

21 ÷ 3 = 7

7 ÷ 7 = 1 ← Quotient

∴ 126 = 2 × 3 × 3 × 7

LEARNING OUTCOME:

Students are able to understand about the prime factors and how to use the prime factors in the process of prime factorization.

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THANKING YOU

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