

CLASS	VI
SUBJECT	MATHEMATICS
TOPIC	PLAYING WITH NUMBERS
SUB TOPIC	PRIME FACTORIZATION
NO OF SESSIONS	5 / 8

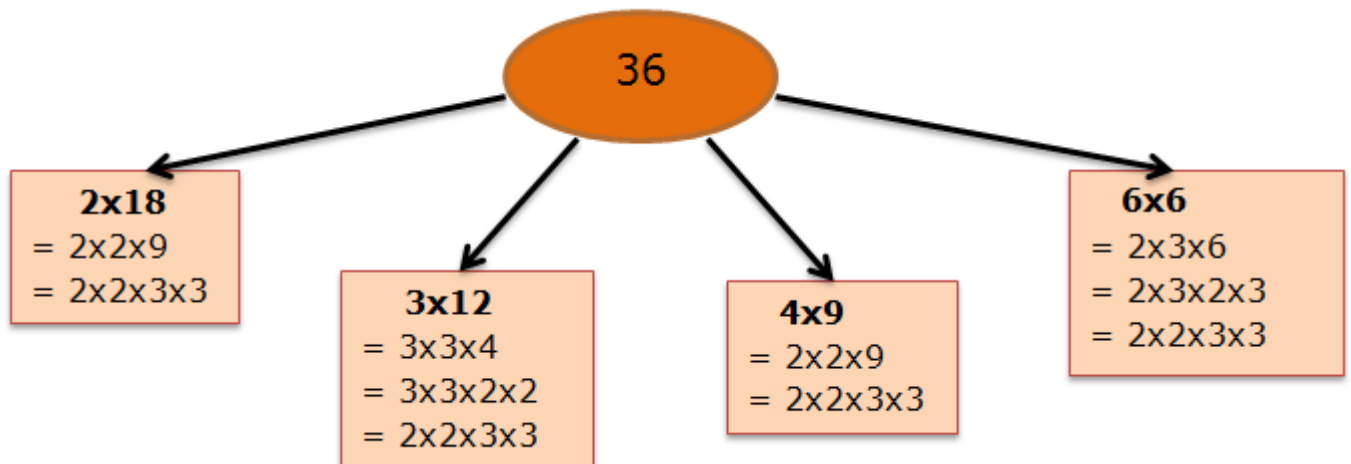
Introduction:

A number is said to be factorized when a number is expressed as a product of its factors. (Factors are the numbers that we multiply together to get another number.)

Example: $36 = 2 \times 18$

Here, the given number 36 is factorized and expressed as a product of its factors (i.e. 2 and 18). This is one of the factorizations of 36.

The others are:



In all the above factorizations of 36, we finally arrive at only one factorization $2 \times 2 \times 3 \times 3$. In this factorization the only factors 2 and 3 are prime numbers. Such a factorization of a number is called a prime factorization.

In prime factorization, we attempt to find prime numbers which when multiplied together, results in original number.

Steps to find prime factors of given number

Let's find out the prime factorization of 16.

Step 1: Divide the given number 16 by smallest prime number i.e.2.

$$16 \div 2 = 8$$

Step 2: The resultant number is 8, which is a composite number, so we need to divide the number further. Let's divide the resultant number by 2 (smallest prime number) again.

$$8 \div 2 = 4$$

Step 3: Again the resultant number is a composite number, so we need to divide the number further. Again try division by 2.

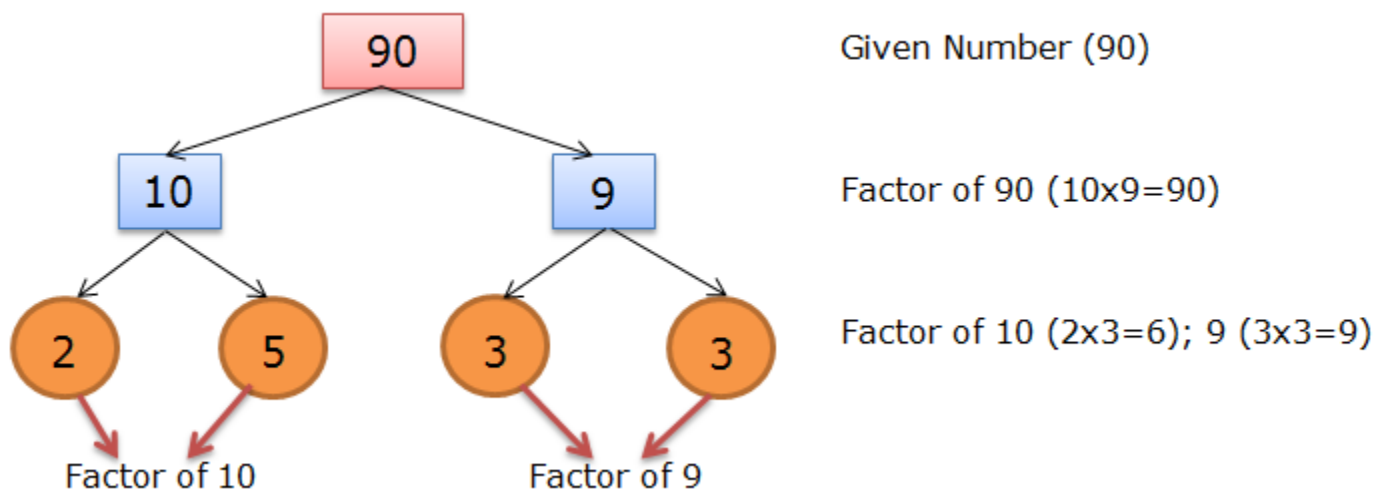
$$4 \div 2 = 2$$

Step 4: The resultant number is a prime number, so we will stop further division. Thus, prime factorization of $16 = 2 \times 2 \times 2 \times 2$

Steps to find prime factorization using factor tree method

A factor tree is a tool that helps us to break down the given number into its prime factors. In this method we factorize the given number and we only stop when we can't find factors any more.

Example 1: Find Prime Factor of 90.



Explanation:

First find out 2 factors of the given number 90. Here two factors are 10 and 9. Now look and determine whether these two factors are prime number or not. If it is not a prime number then factor it again. Repeat this process until we get all our factors prime.

The ends are all the prime factors of the original number. Here we see the factor tree of 90 which reveals that $90 = 2 \times 5 \times 3 \times 3$.

Assignment:

1. What is the prime factorization of 48?
2. Write the prime factors of 2664 without using exponents.

3. Is $40 = 20 \times 2$ an example of prime factorization process? Justify.
4. Write 6393 as a product of prime factors.
5. Which of the following show prime factorization

a. $10 = 2 \times 5$

b. $20 = 2 \times 10$

c. $40 = 2 \times 2 \times 2 \times 5$

6. Each of the following is the prime factorization of a certain number. Find the number.

a. $2 \times 5 \times 7$

b. $3 \times 7 \times 7$

c. $2 \times 7 \times 13$

d. $2 \times 2 \times 3 \times 5$

7. Find the prime factors by division method.

a. 42

b. 95

8. Do the prime factorization by factor tree method.

a. 30

b. 72

Homework: Exercise 3.5 → Q 3 to Q12

Video link: <https://m.youtube.com/watch?v=XGbOiYhHY2c>