

RAM Maths Circle

March 1, 2026

Nagpur

The class began with a short revision of last week's topic on classical cryptography. Students were asked to recall the types of ciphers discussed:

1. Caesar cipher – shifting letters by a fixed number.
2. Atbash cipher - reverse the alphabet (AZ, BY, etc.).
3. Vigenère cipher – using a keyword to apply multiple shifts.

1 Introduction of Combinatorics in Cipher

After the revision, the session moved toward an introduction to Combinatorics — the branch of mathematics dealing with counting, arrangements, and selections. The concept was introduced in a simple and relatable way: How many possible shifts are there in Caesar cipher? How many possible keys can be formed? How many different encrypted messages can exist?

To make the session more interesting, we discussed:

What happens if we apply two ciphers together?

How does the number of possibilities increase?

Why stronger encryption often depends on mathematical combinations?