

RAM Maths Circle

March 28, 2026

Nagpur

Introduction

The session on Algebraic Expressions focused on building a clear understanding of their concepts and applications. It highlighted how algebraic expressions connect to broader topics such as polynomials and the quadratic theorem, as well as their role in the study of parabolas, further linking mathematics to real-life applications. Overall, the session helped strengthen our conceptual foundation and demonstrated the relevance of algebra in both mathematics and everyday situations.

Exploration:

It was amusing to see students finally being able to connect maths with real-life applications, like parabolas with bridges. Students engaged in interesting concepts and developed a clearer understanding of algebraic expressions and their significance.

Question 1:

For each of the following quadratic expressions, let the roots be α and β . Find:

$$\frac{1}{\alpha} + \frac{1}{\beta} \quad \text{and} \quad \alpha^2 + \beta^2$$

1. $x^2 - 13x + 28$
2. $x^2 - 3x + 1$
3. $3x^2 + 2x + 1$
4. $3x^2 - x + 4$

Question 2:

1. Derive the quadratic formula.
2. Derive the relations between the roots and coefficients of a quadratic equation:

$$\alpha + \beta = -\frac{b}{a}, \quad \alpha\beta = \frac{c}{a}$$

