

# RAM Maths Circle

February 15, 2026

Nagpur

## Introduction

Today's session is mainly about improving our logical thinking and understanding concepts in a better way. Instead of using direct formulas, we will try to solve problems by using reasoning, diagrams, and patterns. The focus is not only on getting the final answer, but also on understanding why the answer is correct. This will help us develop a better problem-solving approach and strengthen our confidence in mathematics.

## 1. The Coin Rotation Puzzle

### Problem:

You have two coins of the same size. One coin is fixed in place. You roll the other coin around the outside edge of the fixed coin (without slipping) until it returns to its starting position, touching the fixed coin at the same point.

How many full rotations does the moving coin make around its own center during this process?

## 2. The Painted Cube

### Problem:

A large cube is made by gluing together  $5 \times 5 \times 5 = 125$  smaller  $1 \times 1 \times 1$  cubes. The big cube is then painted on all six outer faces.

After the paint dries, the big cube is completely disassembled back into the 125 little cubes.

How many of the small cubes have exactly 2 faces painted, exactly 3 faces painted, exactly 1 face painted, and no faces painted?