

RAM Maths Circle

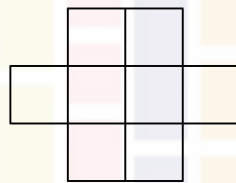
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Nagpur

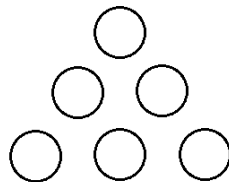
In our first session of the Math Circle, we introduced students to the beauty of mathematics through intriguing puzzles. These carefully crafted problems sparked curiosity and encouraged logical thinking, making math both fun and engaging. Our goal was to ignite interest and foster a love for problem-solving among the students.

Questions

1. The given grid consists of 8 cells. You are required to fill the grid with the numbers 1 to 8 such that no two adjacent cells (including diagonally adjacent cells) contain consecutive numbers.



- (a) Are there more possible solutions? If yes, how many?
2. In the given triangular arrangement of six circles, fill each circle with a unique integer from the set 1, 2, 3, 4, 5, 6. The arrangement satisfies the condition that the number in any circle located above two other circles is equal to the absolute difference of the numbers in the two circles directly below it. Determine the correct placement of the numbers to meet this condition.



- (a) Are there more possible solutions? If yes, how many?

Fun Activity

We had a hands-on activity for the students, where they were provided with connectors and straws as building materials and tasked with building various three-dimensional (3D) figures. For each figure they created, the students were instructed to carefully record the following details:

- The number of **straws** used (representing the edges of the 3D figure),
- The number of **connectors** used (representing the vertices of the figure),
- The number of **faces** formed in the structure.

As the students completed their observations and compiled data from multiple 3D figures, they noticed a recurring numerical relationship among the vertices, edges, and faces. Through exploration and analysis, they identified a consistent pattern in the form of a mathematical relation, which was later formally introduced to them as **Euler's Formula** for polyhedra:

$$V - E + F = 2$$

Game: Twenty-Twenty

Objective: The goal of the game is to be the player who says the number **20**.

Rules of the Game:

1. The game is played between **two players**.
2. The first player starts by saying either **1** or **2**.
3. On their turn, the next player adds **1** or **2** to the number said previously.
4. The game continues with players alternately adding **1** or **2** to the current total.
5. The player who says the number **20** is declared the **winner**.

Task for Students:

The students were challenged to analyze the game and come up with a **winning strategy**. The strategy must ensure that they **always win** the game, irrespective of the opponent's moves. They were given the choice to decide whether to **go first** or allow their opponent to start the game.

This activity served as a **food for thought** to develop students' logical reasoning, strategic thinking, and problem-solving skills through a simple, yet thought-provoking game.