Bids & Brains
Round 3 Question Paper

MATHEMATICS CLUB

February 2025

Instructions

- You will be given 30 minutes to solve the questions you have acquired in round 2.

- You can choose to solve any / all of the 3 *coal* questions in this paper in addition to round 2 questions.

- Any use of online resources / gadgets is prohibited.

- Use of calculators of any kind is prohibited.

§1 Mellow manipulation

A and $B \in \mathbb{R}^{3 \times 3}$. Find $4 \det(A^{16} + B^{16}) - 1$ if the matrices A and B are anti-commutative and the matrix $A + B$ is non-invertible.

§2 An even sum

An unfair coin has a 2/3 probability of turning up heads. If this coin is tossed n times, what is the probability that the total number of heads is even?

§3 An odd equation

What is the probability that the roots of the equation $ax^2 + bx + c = 0$ are rational when a, b, c are picked randomly (with replacement) from $\{-7, -5, -3, -1, 1, 3, 5, 7\}$.

Team Name:

Name of Bidder 1:
Roll no. of Bidder 1:
Contact of Bidder 1:

Name of Bidder 2:
Roll no. of Bidder 2:
Contact of Bidder 2:

1.

2.

3.

Answers to the questions you have purchased in round 2: