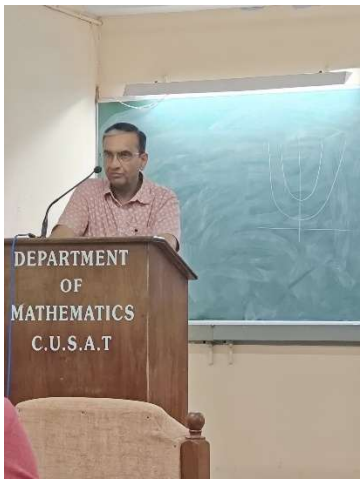
MADHAVA MATHEMATICS COMPETITION NURTURE CAMP - 2025

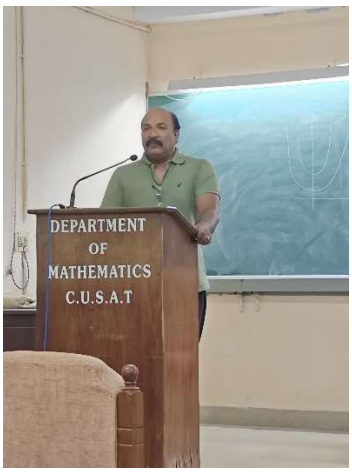
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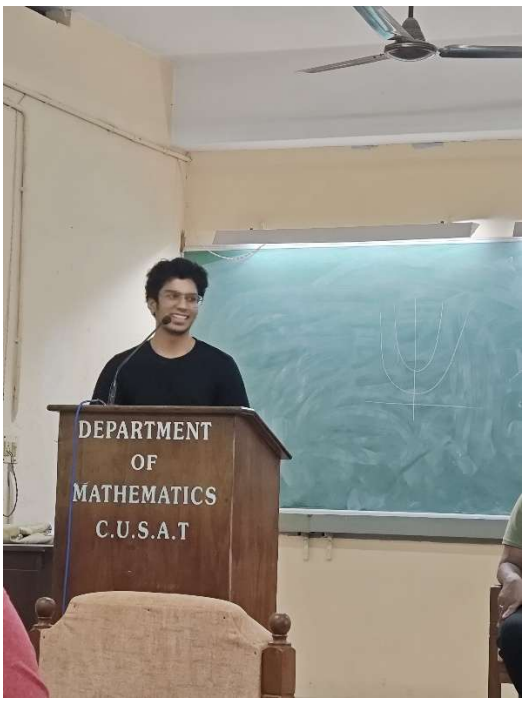






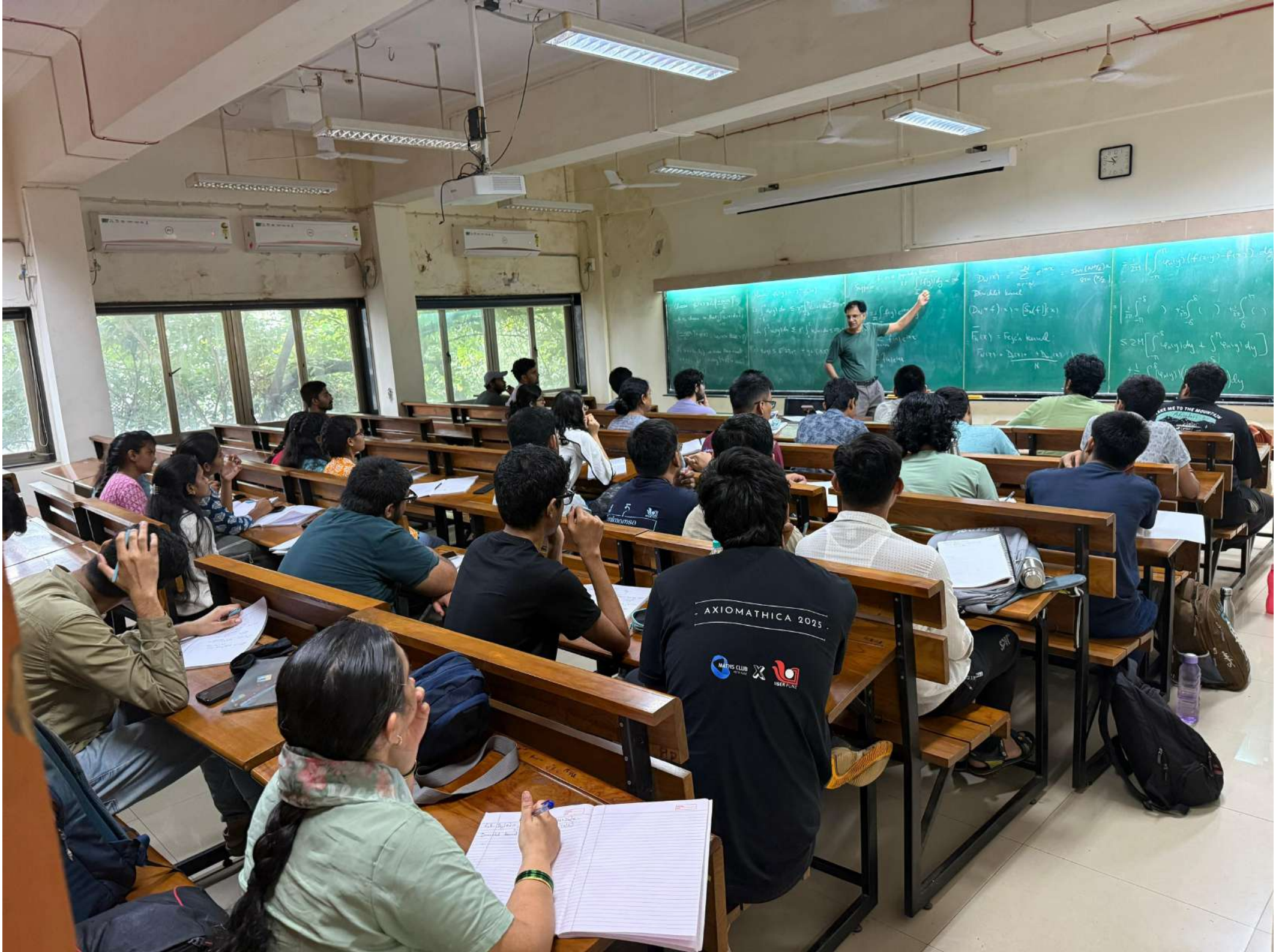



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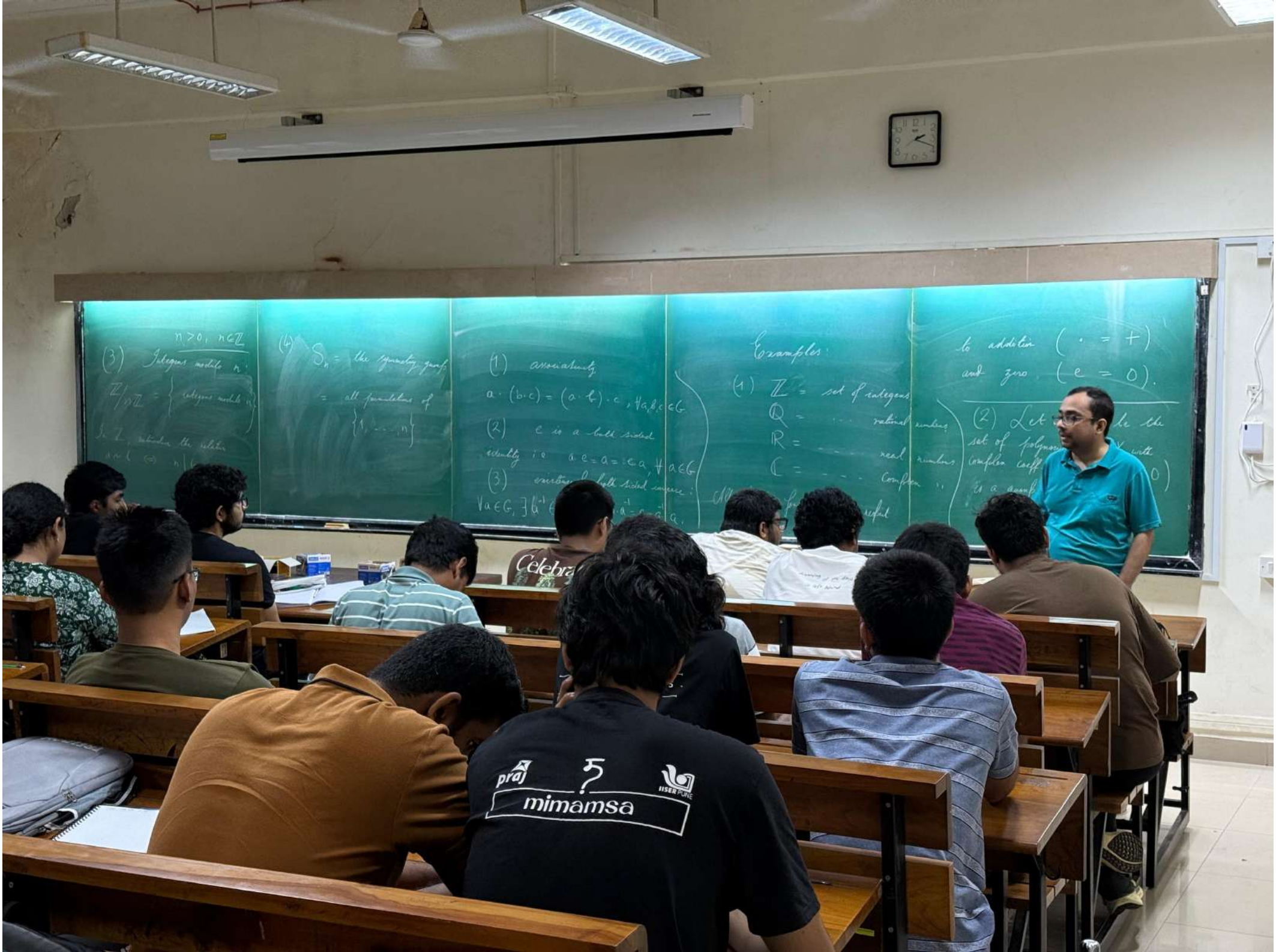

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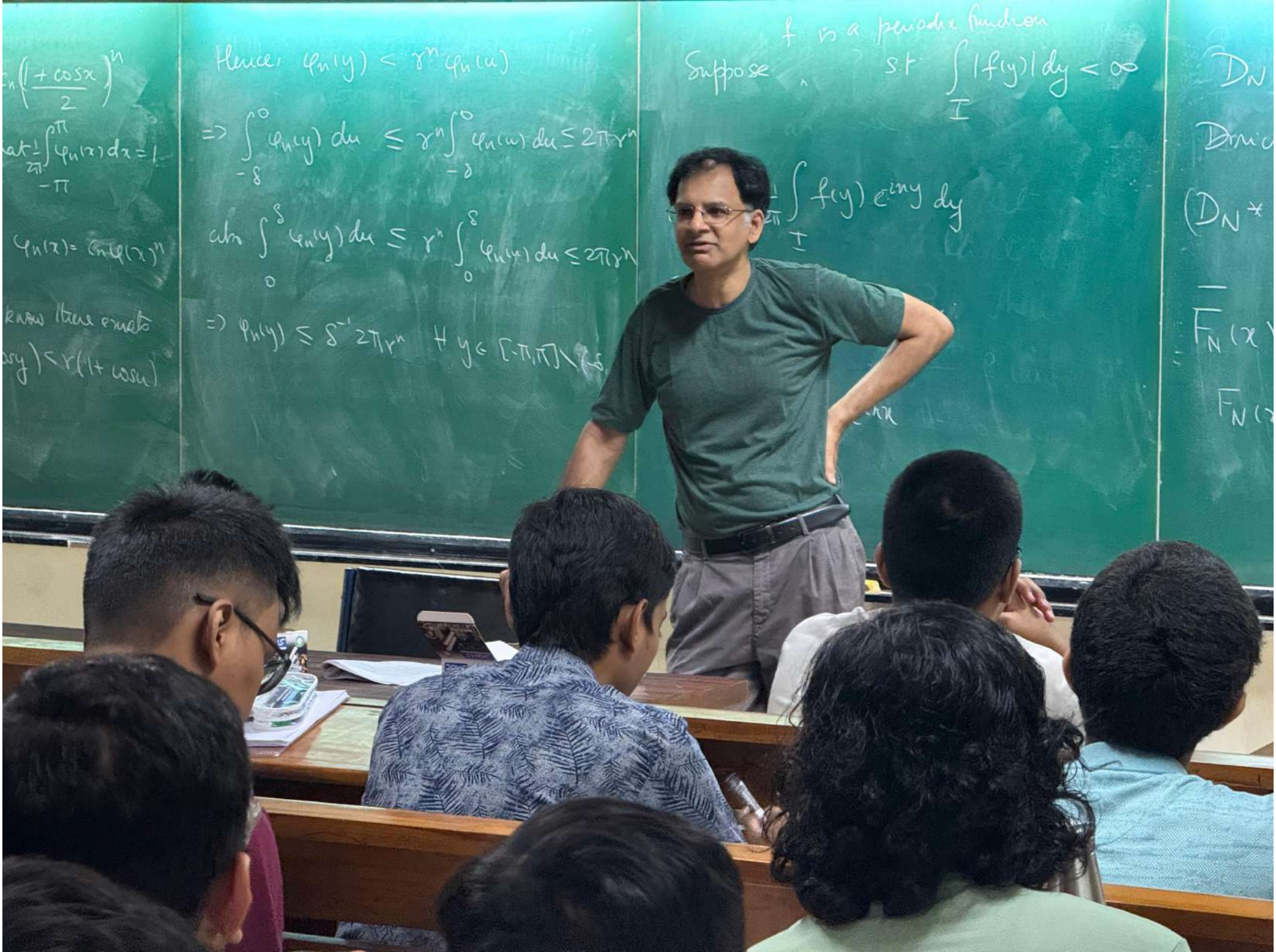


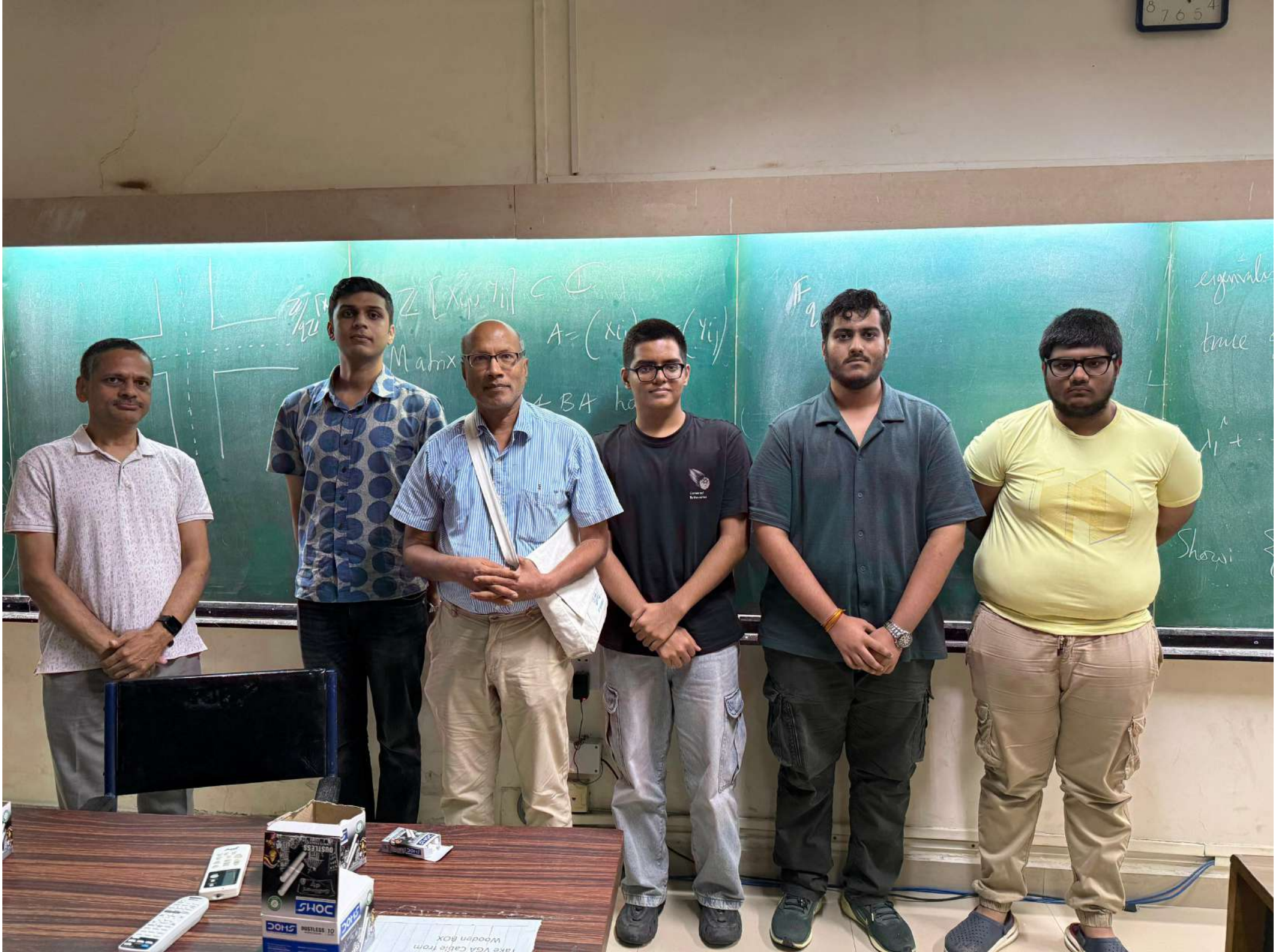

AXIOMATHICA 2025
MATHS CLUB
USER PLANET


AXIOMATHICA 2025
Proofs from THE BOOK


Examples:
(1) ℤ = set of integers
ℚ = ... rational numbers
ℝ = ... real numbers
ℂ = ... Complex ...
(2) Let ... be the set of polynomials ... with complex coeff ...
(3) Integers modulo n:
(4) S_n = the symmetry group
= all permutations of
{1, ..., n}
(1) associativity
a · (b · c) = (a · b) · c, ∀ a, b, c ∈ G
(2) e is a both sided identity i.e a · e = a = e · a, ∀ a ∈ G
(3) existence of both sided inverse:
∀ a ∈ G, ∃ b ∈ G
to addition (· = +)
and zero (e = 0).
praj
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Smooth Surfaces:
① B^2 = unit disc in $\mathbb{R}^2$
$= \{(x,y) \in \mathbb{R}^2 : x^2+y^2 \le 1\}$
γ = boundary of
$\partial(B^2) = \{x^2+y^2=1\} = S^1$
$\approx S^1$
② $S^2 = \{x^2+y^2+z^2=1\} \subset \mathbb{R}^3$
$\partial(S^2) = \phi$
③ $S \times I$ = cylinder
$I = [0,1]$
④
$I^2/(x,0) \sim (x,1)$
I^2
$\gamma/2$
$\gamma/2$


Hence, $\varphi_n(y) \le r^n \varphi_n(u)$
$\Rightarrow \int_{-\delta}^{0} \varphi_n(y)\,dy \le r^n \int_{-\delta}^{0} \varphi_n(u)\,du \le 2\pi r^n$
$\Rightarrow \int_{0}^{\delta} \varphi_n(y)\,dy \le r^n \int_{0}^{\delta} \varphi_n(y)\,dy \le 2\pi r^n$
$\Rightarrow \varphi_n(y) \le \delta^{-1} 2\pi r^n \quad \forall\, y \in [-\pi, \pi]$
Suppose f is a periodic function
s.t $\int_I |f(y)|\,dy < \infty$
$\frac{1}{2\pi} \int_I f(y)\, e^{-iny}\,dy$
D_N
$D_N *$
$F_N(x)$


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