INTEGRAL CUP

Integral Cup 2025

Phase 2 – Campus Finals
Formats and Rounds

1. Syllabus

- Basic Integration Techniques
- Integrals Related to Series.
- Gaussian Integrals
- Volume Under Manifolds in n Dimensions
- Integrals Derived from Differential Calculus

2. Campus Finals Overview

- Conducted offline at each IIT during **April 2025**, schedule available on website.
- Consists of **4 stages**:
  i. **Top 16**
  ii. **Quarter Final**
  iii. **Semi-Final**
  iv. **Final**

2.1. TOP 16

- Total Participants: Up to 16
- Participants will be divided into groups of 3 or 4, depending on attendance.
- Each group solves **5 integrals**, with **3 minutes per integral**.
- After Round 1, top 8 scorers (across all groups) qualify for the next round.
- Top **2 participants** from each group will qualify for the Quarterfinals round.
- **Scoring System:** Scoring depends on how many players answer a question correctly in a group:

1. If a participant solves an integral and others don't:
   - The solver earns points equal to the number of others who didn't solve it.
   - The non-solvers each lose points equal to the number of solvers.
   - *Example:* 1 solves → earns **3 points**, 3 others each lose **1 point**.

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Correct Players	Scoring
1 correct	+3 (to correct one), -1 (to others)
2 correct	+2 (to correct ones), -2 (to others)
3 correct	+1 (to correct ones), -3 (to the wrong one)
All correct/incorrect	+0 to all

2. If all get it wrong: All get 0.
3. Total score for each question always sums to 0, ensuring fairness.
4. **Tie-Breaker:** The number of correct answers will be used to resolve ties.

- **Group Size Variations & Scaling:** Depending on how many participants show up, groups may vary:

Participants	Grouping	Scoring System	Scaling Needed?	Notes
16	4 groups of 4	+3 to -3	❌ No	Ideal case
15	3 groups of 4, 1 group of 3	Mixed	☑ 3-player group scaled to /15	
14	2 groups of 4, 2 groups of 3	Mixed	☑ 3-player groups scaled	
13	1 group of 4, 3 groups of 3	Mixed	☑ 3-player groups scaled	
12	3 groups of 4	+2 to -2	❌ No	
11	2 groups of 4, 1 group of 3	Mixed	☑ 3-player groups scaled	
10	2 groups of 3, 1 group of 4	Mixed	☑ 3-player groups scaled	
9	3 groups of 3	+2 to -2	☑ All scaled to /15	
≤8	all are qualified to next round			

Scaling ensures fairness regardless of group size.

- For any 3-member group, raw score (out of max 10) will be scaled to /15 by multiplying by 1.5.
- For mixed rounds (e.g., both 4s and 3s), make sure to scale all 3-player group scores before ranking.

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Ranking Within Groups

- Participants will be ranked based on their **total score** within their group.
- Ties will be broken using the following criteria (in order):
    1. **Head-to-head result**
    2. **Highest individual match score**
    3. **Minimum number of losses**
- A total of **8 participants** will move forward to the knockout stage.

2.2. QUARTER FINALS

Ranking for Quarterfinals

- The 8 qualified participants will be ranked globally (1 to 8) based on their total scores (after scaling, if applicable).
- Ties in global ranking will be broken using:
    1. Higher scaled total score
    2. Number of wins
    3. Highest individual match score
    4. Random draw, if needed
- Knockout round based on Top 16 rankings:
    - QF1: 1st vs 8th
    - QF2: 2nd vs 7th
    - QF3: 3rd vs 6th
    - QF4: 4th vs 5th
- Each match has **3 integration problems**, **3 minutes** each.
- **Tie-breaker:** Additional rounds until a winner emerges.

Match	Players
QF1	Rank 1 vs Rank 8
QF2	Rank 2 vs Rank 7
QF3	Rank 3 vs Rank 6
QF4	Rank 4 vs Rank 5

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2.3. SEMI-FINALS

- Knockouts:
  - SF1: Winner of QF1 vs Winner of QF4
  - SF2: Winner of QF2 vs Winner of QF3
- **5 integration problems**, **4 minutes** each.
- Tie-breaker by extra rounds.

2.4. FINAL

- **Final match:** SF1 winner vs SF2 winner.
- **7 integration problems**, **5 minutes** each.
- Tie-breaker: Continue additional rounds until a winner is decided.

3. General Rules

- No calculators, formula sheets, or electronics.
- Integrals can be **definite or indefinite**.
- No need to include "+C" in indefinite integrals.
- Answers may use powers, factorials, binomial coefficients.
- Only the **final answer** is evaluated.
- Answers must be **clearly circled or boxed**.
- Time must be recorded.
- To change an answer, participants must **erase or strike through** the old one.

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