Integration Bee

Mathematics Club

Question

Question

Question

Question

Question 9

Question 10

INTEGRATION BEE

Semi-Finals

Mathematics Club

CFI, IITM

September 15, 2025



Mathematics Club

Question 1

Question 3

Question 4

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Question 10



Semi-Final 1

Evaluate:

$$\int_{-1}^{1} e^{-x} \frac{\cos(\sqrt{1-x^2})}{\sqrt{1-x^2}} \, \mathrm{d}x$$

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Question :

Question 2

Question 3

Question 4

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Find the value of

$$\sum_{n=0}^{\infty} \int_0^{2^{2025}} \left[\frac{x + 2^{n-1}}{2^n} \right] dx$$

Question 3

Question 4

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Question 10



$$A = \int_0^\infty \frac{e^{-x^2}}{x^2 + 1} dx$$
 , $B = \int_1^\infty \frac{e^{-x}}{\sqrt{x}} dx$

Evaluate $\frac{A}{B}$

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Question

Question 4

Question 6

Question

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Semi-Final 1 Tie Breaker

$$\int \ln(x) \ln(1 - \ln(x)) \, \mathrm{d}x$$

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Question

Question .

Question 5

Question 6

Question

Question

Question 10



Semi-Final 1 First to solve

$$\int_{\frac{1}{4}}^{\frac{9}{4}} \left(x - \frac{1}{4} \right)^{\frac{1}{2}} \left(\frac{9}{4} - x \right)^{\frac{3}{2}} \, \mathrm{d}x$$

- Question
- _____
- Question 4
- Question 6
- Question
- 0.....
- Question 3





Semi-Final 2

$$\int e^{e^x} e^x \left(\cos(e^{e^x}) + \cos(e^x)\right) dx$$

Question :

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Question 4

Question 7

Question

Question 9

Question 10



Let $F(a,b): \mathbb{R}^2 \to \mathbb{R}$ be a function defined as

$$F(a,b) = \int_0^\infty \frac{\ln(a^2 + b^2 x^2)}{1 + x^2} \, \mathrm{d}x$$

What is the value of F(20, -5)

Question 4

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Question 8

Question 9

Question 10



$$\int_0^\infty \frac{e^{\frac{x}{3}}}{e^x + 1} \, \mathrm{d}x$$

Question A

Question 3

Question 4

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Question

Question 9

Question 10



Semi-Final 2 Tie Breaker

$$f(y) = \int_0^1 \frac{1}{(1+xy)(\sqrt{1-x^2})} dx$$

Find
$$\int_0^1 f(y) dy$$

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Question

Question 10



Semi-Final 2 First to solve

$$\int_0^{\frac{\pi}{2}} \cos^4(x) \sin(6x) \, \mathrm{d}x$$