Integration Bee

Mathematics Club

Question

Question -

Question 0

Question I

Integration Bee

Finals

Mathematics Club

CFI, IITM

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Mathematics Club

Question 1

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$$A = \int_0^\infty \ln^2(1+e^{-x})\mathrm{d}x \quad B = \int_0^{\frac{\pi}{4}} \frac{\ln(\sin x)\ln(\cos x)}{\sin x \cos x}\,\mathrm{d}x$$
 Find $\frac{A}{B}$

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Question

Question 2

Question

Question 4

Question

Question



$$A = \int_0^1 \int_0^1 \frac{\ln(x^2) \ln(y^2)}{1 - xy} \, dx dy$$

$$B = \int_0^1 \int_0^1 \frac{(xy \ln(xy))^2}{1 - xy} \, dx dy$$
 Evaluate
$$\sqrt{\frac{3A - 2B + 1}{3A - 2B + 4}}$$

Question

Question 3



$$\int_0^\infty \frac{\sin^3 x}{x^2} \, \mathrm{d}x$$

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Question

Question

Question 4



$$\int_0^{\frac{\pi}{4}} \sqrt{\frac{\tan x}{\tan 2x}} \, \mathrm{d}x$$

0 .. 4

Question 5

Question 6



Tie Breaker - 1

$$\int_0^\infty \frac{x}{\sqrt{e^x - 1}} \, \mathrm{d}x$$

Question 4

Question 6

Question '



Tie Breaker - 2

$$\int e^{\cos x} \left(\frac{1}{\sqrt{2}} + \sin\left(2x - \frac{\pi}{4}\right) + 2\sin\left(x - \frac{\pi}{4}\right) \right) dx$$

Question .

Question 6

Question 7



First To Solve

$$\int_0^1 \frac{\ln(1+x)}{x} \, \mathrm{d}x$$