

# INTEGRATION BEE

## Round 3

*Mathematics Club*

CFI, IITM

September 15, 2025



Instructions

Question 0

Question 1

Question 2

Question 3

Question 4

Question 5

Question 6



$$\int_1^2 x \, dx$$

Instructions

Question 0

Question 1

Question 2

Question 3

Question 4

Question 5

Question 6



Evaluate:

$$\int_0^1 \frac{x + x^{\frac{4}{3}} + x^{\frac{5}{3}} - 3x^5}{1 - x} dx$$



Find the value of

$$\int_0^{\frac{\pi}{4}+1} \tan(x - \tan(x - \tan(x - \cdots))) \, dx$$



Find the value of

$$\int_0^1 \frac{\ln(1+x)}{1+x^2} dx$$



Evaluate :

$$\int_0^{\infty} \frac{\sin(\pi x)}{x(1-x^2)} dx$$



Evaluate:

$$\int_0^1 \frac{x^{2024}}{2024!} (\ln(x))^{2024} dx$$



Let  $I_n$  denote :  $I_n = \int_0^n \lfloor \log_n x \rfloor dx$

Find the value of  $\frac{I_3}{I_5}$ .