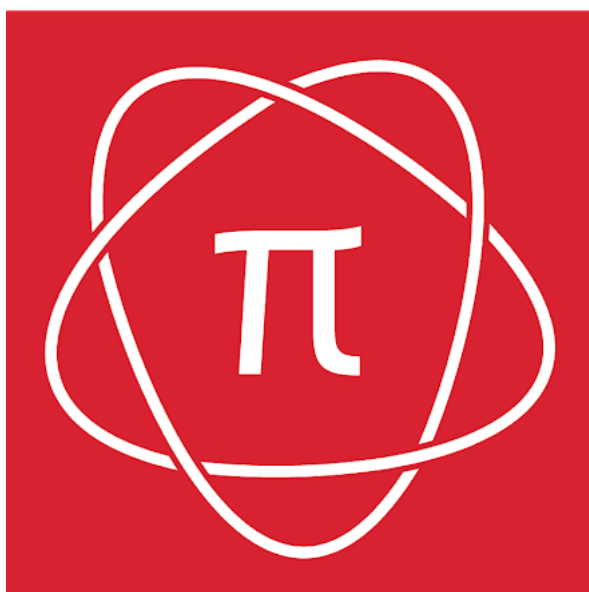


Carleton University Mathematics & Statistics Society

2024 Integration Bee

Qualifiers



Instructions

In the next page, you will find a list of ten integrals to solve. Your solutions are to be submitted through this [google form](#) as a **single pdf file before April 3rd, 3:00pm**, you only have one submission. Please show as much work as possible, detailed and concise solutions will score more favourably, hence increasing your chances of entering the Top 8 for the finale. Good luck!

Qualifier Integrals

1.

$$\int \frac{\ln\left(\frac{x}{\pi}\right)}{\ln(x)^{\ln(\pi e)}} dx$$

2.

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

3.

$$\int \sqrt{\pi x \sqrt{\pi x \sqrt{\pi x}}} dx$$

4.

$$\int_1^4 t \sin(2t) dt$$

5.

$$\int \frac{4}{x^2 + 5x - 14} dx$$

6.

$$\int_0^1 e^x \sin(2x) dx$$

7.

$$\int x e^{\sqrt{x^2+1}} dx$$

8.

$$\int_0^3 \frac{3x}{\sqrt{x^2+9}} dx$$

9.

$$\int_0^{4\pi} (\sinh x + \cosh x)^{506} dx$$

10.

$$\int_0^1 \frac{1}{x^2 - 2x + 2} dx$$