Renert School: Integration Bee 2025–2026

Problem 1.

$$\int_1^{mower} \frac{1}{u}\, du$$

Problems 2-17 are great review.

Problem 2.

$$\int_{-8}^{-1} \left(\frac{2}{x^{1/3}} + 4x \right) dx$$

Problem 3.

$$\int \frac{\sqrt{r} - 5}{\sqrt{r}}\, dr$$

Problem 4.

$$\int s(\sqrt{s} + 1)\, ds$$

Problem 5.

$$\int_{\pi/6}^{\pi/3} \sin(2x)\, dx$$

Problem 6.

$$\int x^3 e^{x^4}\, dx$$

Problem 7.

$$\int (2x - 1) \sin(4x)\, dx$$

Problem 8.

$$\int \frac{\sec\theta \tan\theta}{\sqrt{\sec\theta + 1}}\, d\theta$$

Problem 9.

$$\int \ln x^3\, dx$$

Problem 10.

$$\int \frac{1}{t^2 - 6t + 10}\, dt$$

Problem 11.

$$\int_{-1}^{1} \frac{1}{x^3}\, dx$$

Problem 12.

$$\int \frac{8x^2 - 2x + 3}{2x - 1}\, dx$$

Problem 13.

$$\int x^2 e^{2x}\, dx$$

Problem 14.

$$\int_e^{e^2} \frac{1}{x \ln x}\, dx$$

Problem 15.

$$\int_0^4 \sqrt{3x + 4}\, dx$$

Problem 16.

$$\int \frac{x + 1}{x(2x + 1)}\, dx$$

Problem 17.

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

Problems 18-30 are still good for review

Problem 18.

$$\int_0^3 \sqrt{9 - r^2}\, dr$$

Problem 19.

$$\int_{-2}^2 (x^2 + 1)(x - \sin x)\, dx$$

Problem 20.

$$\int_1^4 \frac{2 + 1/\sqrt{x}}{x + \sqrt{x}}\, dx$$

Problem 21.

$$\int x(1 - x)^{2025}\, dx$$

Problem 22.

$$\int_0^1 \frac{x}{1 + x^4}\, dx$$

Problem 23.

$$\int \frac{1}{2025^x}\, dx$$

Problem 24.

$$\int_1^\infty \frac{1}{x(x^2 + 1)}\, dx$$

Problem 25.
$$\int \frac{2^x + 3^x}{5^x}\, dx$$

Problem 26.
$$\int \frac{1}{(x^2 - 1)^2}\, dx$$

Problem 27.
$$\int_1^e \ln(x^5)\, dx$$

Problem 28.
$$\int_{-4}^0 \sqrt{-4x - x^2}\, dx$$

Problem 29.
$$\int \frac{1}{1 + e^{-x}}\, dx$$

Problem 30.
$$\int_{-2}^2 (x + 3)\sqrt{4 - x^2}\, dx$$