

2025 Calculus Bee
Tuesday, April 15, 2025

1st Place	Duc Toan Nguyen
2nd Place	Spencer Scherger
3rd Place	Ben Tran

1. Find $\int \heartsuit^{2025} d\heartsuit$.
2. Find the derivative of $\sqrt{\sin(w^{17} + 2025)}$
3. Evaluate $\int_{-\pi}^{\pi} 1 + \arctan^{11}(2025t) dt$.
4. Evaluate $\int \frac{1}{\sin x - \frac{1}{\sin x}} dx$.
5. What value of x in $(0, \infty)$ minimizes $x^3 + \frac{1}{x^6}$?
6. Find $\lim_{x \rightarrow 0} x^{-2} e^{2025x} (\cos(3x) - 1)$.
7. A triangle has vertices $(0, 0)$, $(1, 0)$ and $(a, a^2 + 3a + 2025)$ for some real number a .
What is the minimum area this triangle can have?
8. Suppose that for all real numbers x , the function $g(x)$ satisfies $\int_0^x g(t) dt = 3x^3 + 2x$.
Find $g(1)$.
9. Find $\int ((x^3)^4)^5 dx$.
10. Evaluate $\sum_{k=0}^{\infty} 2021^k 2025^{-k}$.