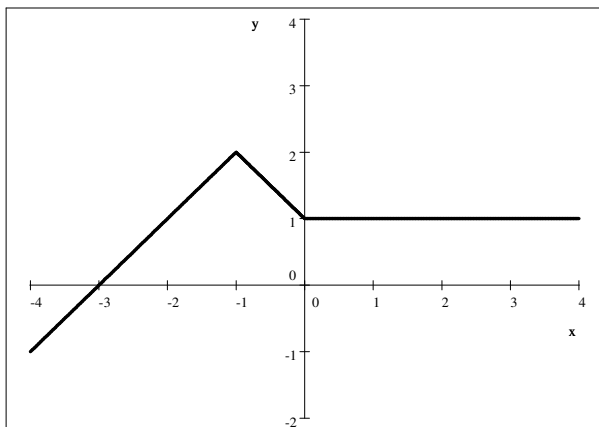


2009 Calculus Bee - April 21, 2009

First Place	Jason Lam
Second Place	Duy Nguyen
Third Place	Liron Bainglass

- Find $\int_{-2009}^{2009} \sin(x^{2009} + 2009x) dx$.
- Find the equation of the tangent line to $y = 3x + 7$ at $x = 2009$. Make sure that your answer is in $y = mx + b$ form.
- Find the derivative of $A(x) = \cos(4x + 2009) + 2009^{2009}$, and simplify.
- Find $\int w \sin(2009w^2) dw$.
- Find all values of x for which $y = \frac{\sin x}{x^3 - 3x^2 + 2x}$ has a vertical asymptote.
- Consider the graph of $y = p(x)$ below.
Find $\int_{-1}^1 p(x) dx$.



- Evaluate $\sum_{n=0}^{\infty} \left(\frac{1}{2009}\right)^n$.
- Find the value of x that maximizes $x^{2009} e^{-2x}$.
- Let $b(x) = \int_{2009}^{2x} \sqrt[3]{t^2 + 5} dt$.
Find $b'(x)$.
- Evaluate $\int \frac{\csc x}{\sec x} dx$.
- Let $g(x) = \sin x + \sin 2x + \sin 3x + \dots + \sin 2008x + \sin 2009x$.
Find, in simplified form, $g'(\pi)$.