

Homework 13

Calculus and Absolute values

Due 8 December 2003, 5 points each:

1. Sketch the graph of $f(x) = e^{|x|-1}$.
2. Let $f(x) = |1 + |x - 5| - x^3|$. Find $f'(2)$.
3. Evaluate the integral $\int_{-2}^2 ||x - 5| - 3 - x^2| dx$.
4. Find the area bounded by the curve $|x| + \sqrt{|y|} = 1$.
5. Find a number m such that the area enclosed by $y = mx$ and $y = |x - 1|$ is 2.

Extra credit: Find the absolute minimum value of the function

$$f(x, y) = |x| + |y| + \sqrt{x^2 + y^2 + 8x - 4y + 20}.$$