Calculus and Absolute values
Problems

1. Sketch the graphs of $f(x) = e^{|x|}$ and $g(x) = e^{|x-1|}$.

2. Let $f(x) = |x^2 - x - 4| + |x + 2|$. Find $f'(3)$.

3. Find the slope of the tangent line to the curve $|x| + |y^3| = 9$ at the point $(1, -2)$.

4. Evaluate the integral $\displaystyle\int_0^4 |||x - 1| - 1| - 2| dx$

5. Find local maxima and minima of $f(x) = e^{|x^3 + 3x^2 - 27x + 10| + 18x}$.

6. Find the area bounded by the curve $|x^3| + |y| = 8$.

7. Find a number c such that the area enclosed by $y = |x^2 - 1|$ and $y = c$ is 8.

8. Find local maxima and minima of $f(t) = \displaystyle\int_0^t (||x - 1| - 1| - 2) dx$.

9. Find the area bounded by the curve $|x + 2| + |3y^3| = 3$.

10. Find the slope of the tangent line to the curve $x^2 + |y^3 - 2| = |xy - 5|$ at the point $(1, 2)$.