

Written Homework 4

Math 126

Solve each of the following problems. Write your solutions clearly and neatly on separate paper, explaining your reasoning with complete sentences. Submit your work either in class or in the homework mailbox (RMS level 3, near the fireplace) by 4:00pm on **Friday, September 20**.

1. If $g(x) = \int_{\ln(x)}^{x^2} \frac{\tan t}{t+1} dt$ then what is $g'(x)$? Explain in words each step that you take.

2. Evaluate $\int (\ln(3x))^2 dx$. Explain what integration techniques you use. If you use integration by parts, clearly state your choices for u and dv .

3. Let f be a twice-differentiable function such that $f(0) = 3$, $f(2) = 5$, and $f'(2) = 1$. Evaluate the integral

$$\int_0^2 x f''(x) dx.$$

Explain your work.