Math 1A Calculus Fall, 2004
Prof. Haiman

**Quiz 11 Solution (Version A)**

1. Evaluate the integral

$$\int_1^4 (1+x)\sqrt{x}\, dx$$

$$\begin{aligned}\int_1^4 (1+x)\sqrt{x}\, dx &= \int (x^{1/2} + x^{3/2})\, dx \Big]_1^4 \\ &= \frac{2}{3}x^{3/2} + \frac{2}{5}x^{5/2} \Big]_1^4 \\ &= (16/3) + (64/5) - (2/3) - (2/5) \\ &= (14/3) + (62/5) = 256/15.\end{aligned}$$

2. Find the derivative of the function

$$f(x) = \int_0^{x^2} \ln t\, dt.$$

Since $f(x) = F(x^2)$, where $F'(x) = \ln x$, the chain rule gives

$$f'(x) = 2x \ln(x^2)$$

(this is also equal to $4x \ln x$, using laws of logarithms).