Math 125A Summer 2009   **Name:** _____

Quiz #1

Show your work. Closed Notes.

1. (5 points) Find the general antiderivative of the function $\dfrac{\sqrt{x}-1}{x}$.

2. (5 points) Find a function $f(x)$ such that $f''(x) = \sin x + e^x$, $f'(0) = 10$, and $f(0) = 0$.

3. (5 points) Use the Midpoint Rule and $n = 4$ to approximate $\int_1^4 x \ln x \, dx$. Round your answer to four decimal places.

$\Delta x = \dfrac{4-1}{4} = \dfrac{3}{4}$

Midpoints: $x_1 = 1.375,\ x_2 = 2.125,\ x_3 = 2.875,\ x_4 = 3.625$

$$M_4 = \frac{3}{4}\left[1.375\ln(1.375) + 2.125\ln(2.125) + 2.875\ln(2.875) + 3.625\ln(3.625)\right]$$

$$M_4 \approx \frac{3}{4}\left[0.4379 + 1.6018 + 3.0362 + 4.6685\right] \approx \frac{3}{4}(9.7443) \approx 7.3082$$