

**Name:** \_\_\_\_\_

**Signature:** \_\_\_\_\_

Show all work clearly and in order, and box your final answers. Justify your answers whenever possible. You have 80 minutes to take this 100 point exam.

1. 20 points Find the area of the region bounded by the given curves.

$$y = xe^{-0.4x}, \quad y = 0, \quad x = 5$$

2. 20 points Make a substitution to express the integral as a rational function and then evaluate the integral.

$$\int_9^{16} \frac{\sqrt{x}}{x-4} \, dx$$

3. 20 points Evaluate the integral.

$$\int_0^1 \frac{y}{e^{2y}} \, dy$$

4. 20 points Evaluate (exact answer) without using a computer.

$$\int_{\pi/4}^{\pi/2} \cot^3 x \, dx$$

5. 20 points Evaluate the Integral.

$$\int \frac{x+4}{x^2+2x+5} \, dx$$