Name _____

Homework 3
section 7.2

Evaluate each of the following integrals.

1. (5) $\int (\ln t)^2 \, dt$

2. (5) $\int x^3 e^{x^2} \, dx$

3. (4) Use integration by parts to derive the following reduction formula:

$$\int x^m \sin x \, dx = -x^m \cos x + m \int x^{m-1} \cos x \, dx$$

4. (6) Let $F(a)$ be the function which gives the area under the graph of $y = xe^{-x}$ between $x = 0$ and $x = a$, for $a > 0$.

   (a) Find a formula for the function $F(a)$.

   (b) Is F an increasing or a decreasing function? Be sure to show work and/or give an explanation in support of your answer.

   (c) Is F concave up or concave down for $0 < a < 1$? Be sure to show work and/or give an explanation in support of your answer.