Math 122 | Applied Calculus II
Spring 2011 | Quiz 6
Instructor: Shawn Rafalski | **Write your name on this quiz**

Compute the following definite and indefinite integrals. It is not necessary to simplify the answers.

1. (3 points) $\int 3x \ln x \, dx =$

$u = \ln x \qquad v = \frac{3}{2}x^2$

$du = \frac{1}{x}\,dx \qquad dv = 3x\,dx$

$= \frac{3}{2}x^2 \ln x - \int \frac{3}{2}x^2 \cdot \frac{1}{x}\,dx = \boxed{\frac{3}{2}x^2 \ln x - \frac{3}{4}x^2 + C}$

2. (3 points) $\int_0^1 xe^x \, dx =$ $\left(xe^x - e^x \right)\Big|_0^1 = (e-e) - (0-e^0)$

$u = x \qquad v = e^x$

$du = dx \qquad dv = e^x dx$

$= 1$

$\int xe^x dx = xe^x - \int e^x dx = xe^x - e^x + C$

(turn this page over)

3. (4 points) $\int \frac{\ln x}{x^3}\,dx =$

$u = \ln x \qquad v = -\frac{1}{2x^2}$

$du = \frac{1}{x}dx \qquad dv = \frac{1}{x^3}dx$

$$= -\frac{1}{x^2}\ln x - \int -\frac{1}{2x^2}\cdot\frac{1}{x}\,dx$$

$$= -\frac{1}{x^2}\ln x + \int \frac{1}{2x^3}\,dx = \boxed{-\frac{1}{x^2}\ln x - \frac{1}{4x^2} + C}$$