MATH 230 NAME:

7.1

Directions: Show all work on a separate sheet of paper for full credit.

1. Evaluate the integral $\int \sqrt{x}\ln(x)\,dx$ using the integration by parts with $u = \ln(x)$ and $dv = \sqrt{x}\,dx$.

$$\frac{2}{3}x^{3/2}\ln x - \frac{4}{9}x^{3/2} + C$$

2. Evaluate the integral.

   (a) $\int te^{-3t}\,dt$ $\qquad -\frac{1}{3}te^{-3t} - \frac{1}{9}e^{-3t} + C$

   (b) $\int (x^2 + 2x)\cos(x)\,dx$ $\qquad (x^2 + 2x)\sin x + (2x + 2)\cos x - 2\sin x + C$

   (c) $\int \cos^{-1}(x)\,dx$ $\qquad x\cos^{-1} x - \sqrt{1 - x^2} + C$

   (d) $\int (\ln(x))^2\,dx$ $\qquad x(\ln x)^2 - 2x\ln x + 2x + C$

   (e) $\int t^4\ln(t)\,dt$ $\qquad \frac{1}{5}t^5\ln t - \frac{1}{25}t^5 + C$

   (f) $\int_0^{2\pi} t^2\sin(2t)\,dt$ $\qquad -2\pi^2$

   (g) $\int_0^1 (x^2 + 1)e^{-x}\,dx$ $\qquad -6e^{-1} + 3$

3. First make a substitution and then use integration by parts to evaluate.

$$\int e^{\sqrt{x}}\,dx = 2\sqrt{x}e^{\sqrt{x}} - 2e^{\sqrt{x}} + C$$