Homework to be done by November 24th

Section 8.1: Problems 24, 33, 35, 37, 49.
Section 8.2: Problems 3, 4, 22, 23, 25, 27, 36, 41, 47, 52, 76.
Section 8.3: Problems 5, 11, 14, 44, 52, 62.
Section 8.4: Problems 1, 9, 11, 15, 35, 49.

Another problem to think about: Suppose that we try to integrate $\frac{1}{x}$ by parts, taking $u = \frac{1}{x}$, $dv = dx$. Then $du = -\frac{1}{x^2}\,dx$ and $v = x$, so

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

Subtracting the integral from both sides, we obtain $0 = 1$. *What is wrong with this calculation?*

Problems to be handed in on November 24th

1. Let S be the solid of revolution formed by revolving the region between the coordinate curves and the curve $y = \cos x$, $0 \le x \le \frac{\pi}{2}$, about the x-axis. Compute the volume of S by both the disc method and the shell method.

2. Evaluate the following integral:

$$\int \frac{x^2}{(x^2+4x+5)^{3/2}}\,dx.$$