Practice problems for second midterm

Our second midterm is on Thursday, February 16th from 7pm to 9pm in Carpenter 013. It will cover u-substitution, area between curves, volumes, and integration by parts. The relevant sections from Stewart are 5.5, 6.1, 6.2, 6.3, and 7.1. You should know:

1. strategies for computing integrals including u-substitution, integration by parts, and symmetry

2. relevant formulas for area between curves

3. relevant formulas for volumes (disk/washer method, cylindrical shells)

4. how to derive u-substitution from the chain rule

5. how to derive integration by parts from the product rule

6. how to compute the following integrals:

   (a) $\int \ln(x)\, dx$

   (b) $\int x \sin(x)\, dx$

   (c) $\int x \cos(x)\, dx$

   (d) $\int x \ln(x)\, dx$

(e) $\displaystyle\int \tan(x)\,dx$

(f) $\displaystyle\int \cot(x)\,dx$

(g) $\displaystyle\int xe^x\,dx$

(h) $\displaystyle\int \frac{\ln(x)}{x}\,dx$

(i) $\displaystyle\int x^3(1+x^2)^{20}\,dx$

In addition to knowing all of the above, you should also be able to do (so go ahead and do them!) all of the problems from section 7.1 in written homework 6, which was (or shortly will be) posted.

If you haven't already done so, take a look at the chapter 6 review worksheet. This worksheet, along with solutions, are posted on the website.

The following is a list of additional practice problems from Stewart:

$$6.3.1,\ 7.1.9,\ 7.1.33,\ 7.1.41,\ 7.1.61.$$