Math 135, HW 2

Due Wednesday, January 21st

1. Show that
$$L[\cos ax] = \frac{p}{p^2 + a^2}, p > 0$$
by integrating.

2. Show that
$$L[\cosh ax] = \frac{p}{p^2 - a^2}, p > |a|$$
without integrating.

3. Find $L[\sin^2 ax]$ without integrating.

4. Find a function whose Laplace transform is:
   (a) $\frac{12}{p^5}$
   (b) $\frac{1}{p^3+p}$

5. Solve the differential equation
$$y'' - 4y' + 4y = x, y(0) = 0, y'(0) = 1$$
using Laplace transforms.

6. Section 51, Problem 4