NAME:_____

HOMEWORK FOR WORKSHEET 11 **MATH 1300** **DUE April 4, 2008**

1. The product rule for derivatives states that if $F(x) = f(x)g(x)$ then $F'(x) = f'(x)g(x) + f(x)g'(x)$. In each of the problems below, find $f(x)$ and $g(x)$ so that $F(x) = f(x)g(x)$ has the indicated derivative.

(a) $F'(x) = 2x\cos x - x^2 \sin x$ (Hint: Try $f(x) = x^2$ and $g(x) = \cos x$.)

(b) $F'(x) = 2xe^x + x^2e^x$

(c) $F'(x) = \frac{1}{x}\sin x + \ln x \cos x$

(d) $F'(x) = e^x \sin x + e^x \cos x$

(e) $F'(x) = 1 + \ln x$

2. Below is the graph of a function f, Suppose another function g has the following properties:

$$g(-1) = 2 \text{ and, for all } x, g'(x) = f'(x).$$

Sketch the graph of g using the same axes.