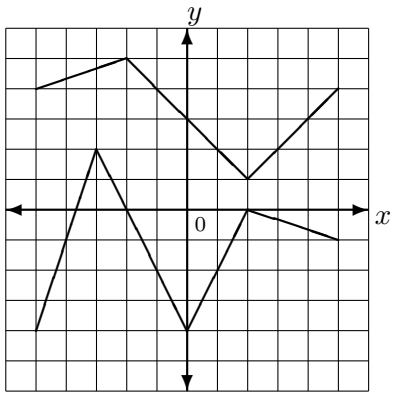
NAME: _____

MATH 12002 **HOMEWORK #4 (13 pts)** **SPRING 2009**

SHOW ALL WORK FOR FULL CREDIT — PLEASE CIRCLE YOUR FINAL ANSWER

DUE: MONDAY, FEBRUARY 23, 2009 AT THE BEGINNING OF CLASS
NO EXCEPTIONS!!!

1. (2 pts each) The graphs of functions f and g are shown below.



   (a) Let $F(x) = f(x) \cdot g(x)$. Compute $F'(-1)$.

   (b) Let $H(x) = \sqrt{f(x)} + [g(x)]^2$. Compute $H'(-1)$.

2. (3 pts) Use implicit differentiation to find the slope of the line tangent to the curve

$$x^3 + x^2y + y^2 = 1$$

   at the point $(1, -1)$.

3. (2 pts) Let y be a differentiable function of x satisfying the equation

$$x^3 + x \sin y = \cos x + 3y^2.$$

   Use implicit differentiation to find y'.

4. (2 pts) Let $f(x) = \left(3x^2 - 5\right)^3$. Find $f''(1)$.

5. (2 pts) Find all values of x (in radians) for which

$$f(x) = \sin^2 x - \sqrt{3}\cos x$$

has a horizontal tangent.