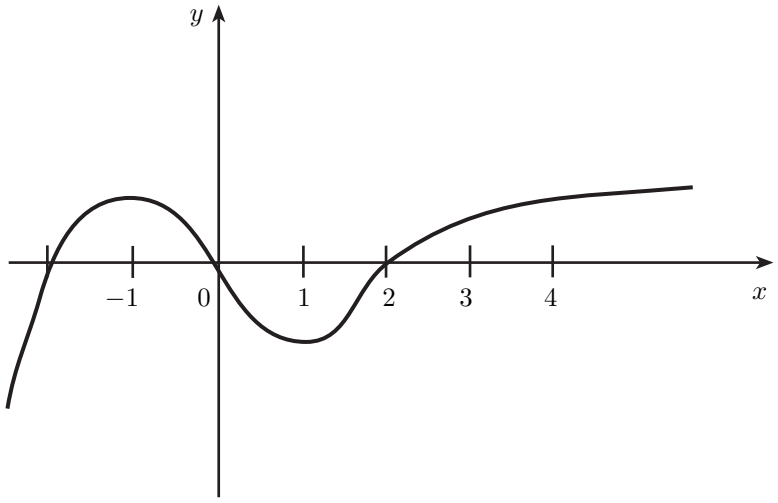
Name:_____

Test 2
Spring 2007
MATH 121 Section 02
March 5, 2007

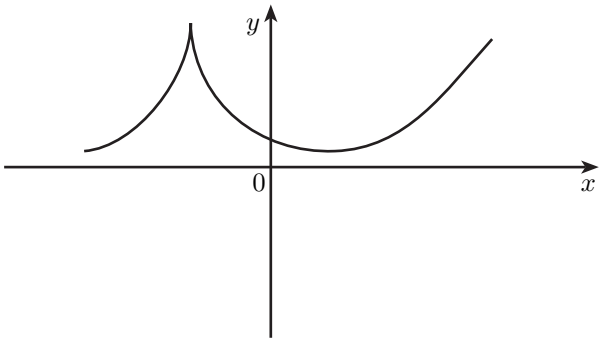
Directions : You have 50 minutes to complete all 5 problems on this exam. There are a possible 100 points to be earned. You may not use your book, notes, or any graphing/programmable calculator. Please be sure to show all pertinent work. *An incorrect answer with no work will receive no credit!* If any portion of the exam is unclear please come to me and I will elaborate provided I can do so without giving away the problem.

1. (10 points)
For the function g whose graph is given, arrange the following numbers in increasing order and explain your reasoning:

$$0 \qquad g'(-2) \qquad g'(0) \qquad g'(2) \qquad g'(4)$$



2. (10 points)
Sketch the graph of f' for the given function f below.



3. (60 points)
Differentiate the function.

(a) $V(r) = \frac{4}{3}\pi r^3$ (b) $y = 4\pi^2$ (c) $g(x) = \frac{3x-1}{2x+1}$

(d) $f(\theta) = \frac{\sec(\theta)}{1+\sec(\theta)}$ (e) $y = \sin(x\cos(x))$ (f) $y = \sqrt{x+\sqrt{x}}$

4. (10 points)
   Find the points on the curve $y = x^3 - x^2 - x + 1$ where the tangent line is horizontal.

5. (10 points)
Use implicit differentiation to find an equation of the tangent line to the curve $x^2 + xy + y^2 = 3$ at the point $(1, 1)$.