

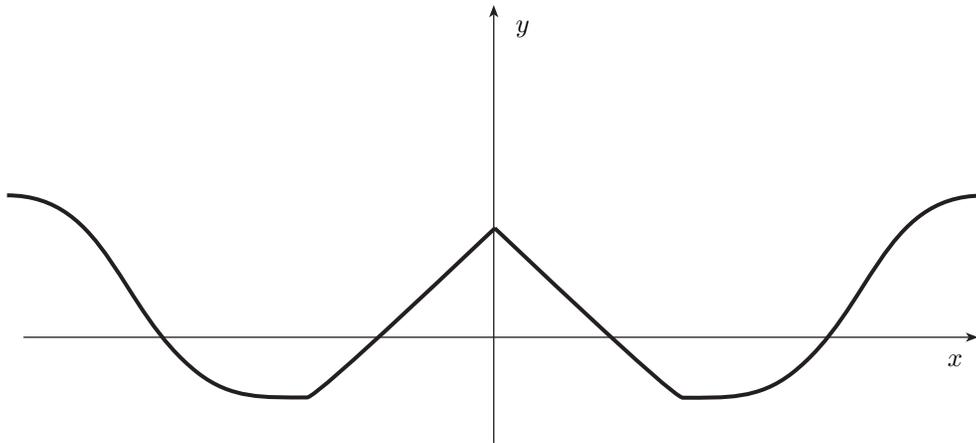
Name: _____

Test 2
Spring 2008
MATH 121 Section 02
February 29, 2008

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. (20 points)

Below is the graph of a function $f(x)$. Tell me where $f(x)$ is not differentiable and then sketch the graph of the derivative of $f'(x)$.



2. (20 points)

Differentiate the following functions with respect to x . Please do not “simplify” your answer.

$$f(x) = (2x^3 + 3)(x^4 - 2x)$$

$$g(x) = \frac{x + 1}{x^3 + x - 2}$$

$$h(x) = 2 \sin(\cos(2x))$$

3. (20 points)

Let $r(x) = f(g(h(x)))$, where $h(1) = 2$, $g(2) = 3$, $h'(1) = 4$, $g'(2) = 5$, and $f'(3) = 6$. Find $r'(1)$.

4. (20 points)

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

5. (20 points)

A healthy dose of the T -virusTM has been fed to a square. While the square is being transformed into a zombie square, the length of each of its sides is increasing at a rate of 6 cm/s. At what rate is the area of the square increasing when the area of the square is 16 cm²?