Math 252 Lab #1 Name(s)_____

(90 points)

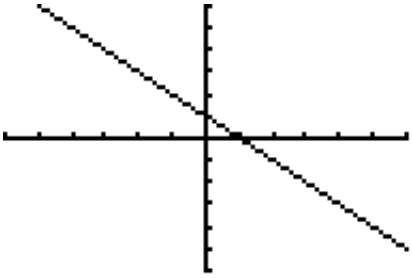
For this lab I expect you to work in groups up to 4 people (to get 10% bonus). You can hand in one "lab report" per team. This lab is due Friday, Week 2; late labs will be reduced by 25% and only accepted up to a week late. It will be graded on completeness, neatness, as well as accuracy. Show work on a separate paper, in pencil please, and staple it to this one, please write the answers here, in pencil:

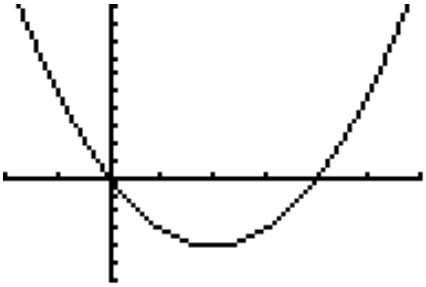
1. Find the derivative of the following functions. Do not simplify.

a) $F(x) = (x^2 - 4x)^5$

b) $G(x) = \ln(x^2 - 3x)$

2. Use the given graph of y = f'(x) to sketch a graph of **an** antiderivative y = f(x).





3. Find the antiderivative of the following functions:

a) $f(x) = 3$

b) $g(x) = 2x + 1$

c) $h(x) = 10x^4 - 8x^3 + 9x^2 + 6x - 3$

d) $k(x) = \sin(x)$

e) $f(x) = 5\left(x^2 - 4x\right)^4 (2x - 4)$

f) $g(x) = \dfrac{2x - 3}{x^2 - 3x}$

4. Find f(x), if $f'(x) = 3x^2 - 4x + 1$ and $f(2) = 10$

5. Find f(x) if $f'(x) = 2x - 3/x^4$ and $f(1) = 3$

6. Find f(x) if $f''(x) = 2x$ and $f'(3) = 4$ and $f(2) = -6$

7. The velocity of a rock thrown upward from the edge of a cliff is given by $v(t) = -32t + 64$. In this case, the velocity is given in feet/sec. If the rock hits the ground at the bottom of the cliff in 6 seconds, how high was the cliff?

8. How fast was the rock in #7 travelling when it hit the bottom?

9. The acceleration of falling bodies here in the USA is approximately $a(x) = -32$ ft/sec^2. If I jump off the top of a waterfall that is 32 feet tall, how long does it take to get to the water? How fast am I traveling when I hit the water?

10. Approximate the area under the curve $f(x) = \sqrt{x}$ from $x = 1$ to $x = 9$. I want you to approximate this area by using the Left Hand Sum, Right Hand Sum and the Midpoint Rule with 4 intervals. Show your work, complete with a sketch of one of the rules mentioned above. Round your answers to the nearest 10,000ths (4 decimal places) at the end, use exact in your calculator.

L_4= R_4= M_4=