MAT125 Spring 2014 Midterm #2

Your name:_____

TA's name:_____

Problem #1: Find the derivative of each function.

a) $f(x) = \frac{3-\sqrt{x}}{3+\sqrt{x}}$

b) $f(x) = (3x^2 + 9x - 4)(4x^3 + x^2 - x)$

Problem #2: Find the equation of the tangent line to $y = \sin(4x)$ at $x = \frac{\pi}{16}$.

Problem #3: Find the *x*-values of the critical points of

$y = x^3 - 6x^2 - 36x + 9.$

Problem #4: Find $\frac{dy}{dx}$ if $x^3 - 5xy^2 + y^3 = 1$.

Problem #5: Find the equation of the tangent line to $\ln(2x^2 - y^2) = 0$ at (1,1).

Problem #6: Find $\frac{dy}{dx}$ if:

(a) $y = \tan^{-1}(2x)$

this question uses material not on our exam that will appear on the final.

b) $f(x) = \sin^3\left(\frac{2-5x}{x^2}\right)$

Problem #7: Find the points (x, y) where the line tangent to $y = x^3 - 6x^2 - 30x + 4$ is parallel to $15x + y = 10$.

Problem #8: Find the values of x where $y = x^2e^x$ has an absolute maximum or minimum on [-3,1]. Justify your answer.

This problem uses material we have not yet covered in class, and so won't be on our midterm.