Homework for Math 152H-1 October 2

Reading: Read section 3.6 pgs 205-209

Homework: Section 3.5 # 67, 69, 71, 75, 79, 83, 87, 89, 93 (don't find the second derivatives), 102

Extra Work:

Calculate the derivative functions of the following functions:

1. $y = \sqrt{x} + x \sin 2x$

2. $y = \dfrac{\sin x}{1 + 2\sqrt{x}}$

3. $y = x \tan(1 + x^2)$

4. $y = (1 + \sin(3x^2))^{10}$

5. What is the equation of the tangent line to the graph of $y = \cos 2x + x^2$ at $x = \frac{\pi}{4}$?

6. What is the equation of the tangent line to the graph of $y = \frac{x^2}{x-1}$ at $x = 2$?

7. Explain where the following function is continuous

$$\left| \frac{\sin(x+1)}{\sqrt{x-4}} \right|$$

8. How should I define $y = \frac{\sqrt{x^2+5}-3}{x-2}$ at $x = 2$ to make it continuous at 2?

9. Use the definition of the derivative to calculate the derivative of $x^2 + \frac{1}{x}$ at 1.

10. Use the definition of the derivative to show that $\sqrt{|x|}$ is not differentiable at 0. (you need only argue that the required limit does not exist)