Written Homework 4

Differentiate the following functions. You do not need to simplify, but you must show all intermediate steps taken. Simply writing an answer will receive NO points. I should see all derivatives you take to arrive at your answer. Use the Lesson 4 worksheet as a guide for how to layout your work.

1. $y = (x^2 + x^3)^4$

2. $y = \left(\dfrac{v}{v^3 + 1}\right)^6$

3. $y = e^{-2t}\cos(4t)$

4. $y = \sqrt{x} + \dfrac{1}{\sqrt[3]{x}}$

5. $y = x^2 \sin x \cos 3x$

6. $y = \dfrac{1 - xe^x}{x + e^x}$

7. $y = \dfrac{\cos 2x + 3x}{1 - \sin 3x}$

8. $y = \sqrt{x + \sqrt{x + \sqrt{x}}}$

9. Find the equation of the line tangent to the graph of $y = \sqrt{1 + 4\sin x}$ at the point $(0, 1)$.

10. If $h(x) = f(g(x))$ where $f(-3) = 8$, $f'(-2) = 4$, $f'(5) = 3$, $g(5) = -2$ and $g'(5) = 6$ find $h'(5)$.