Homework 2

Due: Wednesday, June 15

Some of these problems get very messy, take your time, and write clear. If I can't read your work you won't receive any credit for the problem.

1. Use the table to answer the following questions *exactly*. Show ALL work, just a value will receive no credit!

x	1	2	3	4
$f(x)$	5	4	10	32
$f'(x)$	6	-72	18	-19
$g(x)$	21	32	4	1
$g'(x)$	5/7	3/5	1/7	$-5/7$

   (a) If $h(x) = (f \circ g)(x)$ what is $h'(3)$?

   (b) If $k(x) = e^{f(g(x))}$ what is $k'(4)$?

   (c) If $j(x) = \sin(f(x))$ what is $j'(2)$?

   (d) If $m(x) = \sin(x) \cdot \tan(g(x))$ what is $m'(4)$?

2. If $f(x) = \sqrt[3]{x^2 + 3x + 6}$ what is the *exact* equation of the tangent line to $f(x)$ at $x = 0$?

3. Factor:
$$x^4 y^{-1} \tan(z) + \sec^2(z) x^9 y^2$$
   (Note: When you factor the x's are you taking out the largest or smallest power of x? What is left? How do you get the 'new' power of x after you have factored? If you do this for x you need to do the same for y.)

4. Find $f'(x)$ when $f(x) = \sqrt[4]{4x^5 + 5x^4} \tan(\sqrt[4]{4x^5 + 5x^4})$ (Simplify, i.e. factor as much as you can–note the previous problem should help with the factoring of this problem.)

5. Find $f'(x)$ when $f(x) = \dfrac{\sin(x) \cdot \csc(x)}{\cot(x)}$ (do NOT simplify!)