Homefun 17
That's So Derivative

MATH 150
10 points

Directions: Work in groups of 2 to 4 in class and then finish outside of class as necessary. Each group should submit **ONE** solution page for the group. (Be sure everyone's name is on it!)

The purpose of this assignment is to practice some old skills with new functions: the trigonometric functions.

1. Calculate each derivative.
   (a) $f(x) = e^{3x^4}\sin(4x^2)$
   (b) $f(x) = \ln(\cos(4x))$
   (c) $f(x) = \dfrac{\sec x}{x^2}$
   (d) $f(x) = \sin(e^{8x})$
   (e) $f(x) = \ln(\sec x + \tan x)$ (and simplify)
2. Find an equation of the tangent line to $f(x) = \tan x$ at $x = 0$.
3. The kinetic energy K of a mass on a spring at time t is given by $K(t) = 8\sin^2(2\pi t)$. Determine the maximum and minimum values of K and the times at which they occur on the interval $[0, 1]$.