1. (3 points)
   
   (a) Find \( y' \) if \( y = 9\sqrt{x} \sin x \).

   (b) Find \( y' \) if \( y = \frac{\sec x}{6 + \tan x} \).

   (c) Compute the limit. Justify your answer!

   \[
   \lim_{x \to 0} \frac{\sin 5x}{\sin 7x}
   \]
2. (4 points)

(a) Find $f'(t)$ if $f(t) = \tan(e^6t) + e^{\tan 6t}$.

(b) Find an equation of the tangent line to the curve $y = \sin(\sin x)$ at $(3\pi, 0)$. 
3. (3 points) Find $y'$ by implicit differentiation.

(a) $8x^2 + 7xy - y^2 = 2$

(b) $e^y \cos(x) = 6 + \sin(xy)$
4. (Bonus 2 points) Find $F'(\theta)$ if $F(\theta) = \arcsin\left(\sqrt{\sin(7\theta)}\right)$. 