Name: _____ _____ **/ 25**

There are 25 points possible on this quiz. No aids (book, calculator, etc.) are permitted. **Show all work for full credit.**

1. **[12 points]** Find the derivative of each function below. Show your work and **use correct derivative notation**. Use parentheses when needed. You do not need to simplify your answers.

   a. $f(x) = \left(1 - x^4\right)^6$

   b. $g(x) = \sqrt{3x + \sin(4x)}$

   c. $h(x) = (\cos(5 - x))^5$

   d. $f(\theta) = \dfrac{\csc(\theta^3) + \theta^3}{3\theta}$

2. [8 points] Find $f'''(x)$ for $f(x) = \tan x$.

$f'(x) =$

$f''(x) =$

$f'''(x) =$

3. [6 points] Determine all x-values on the interval $[0, 2\pi]$ where the graph of $f(x) = \cot(x) + 2x$ has a horizontal tangent.