

Name: _____ / 25

There are 25 points possible on this quiz. *You should be able to complete it without using your notes or textbook or a calculator — this is practice for your exams!* If you needed to look something up, you should to me about questions you might have. **Show all work for full credit** and use some words or sentences to help communicate your answers.

1. **[15 points]** Find the derivative for each function below. You do not need to simplify. You do need to use parentheses correctly.

a. $f(x) = \csc(x) + \tan\left(\frac{\pi}{6}\right)$

b. $y = \sec(6x^3)$

c. $g(\theta) = \theta^5 (\cot(t))^4$

d. $h(t) = \left(\sin\left(\frac{\pi}{2}t\right)\right)^5$

e. $y = \sqrt[3]{\tan\left(\frac{x}{5}\right) - 4x}$

2. [5 points] Find $f''(x)$ for the function $f(x) = \sin(5x^{1/3})$. You do not need to simplify your final answer.

3. [5 points] Let $g(x) = (x^2 - 6x)^3$.

a. Find $g'(x)$.

b. Find all x -values where the graph of $g(x)$ has a horizontal tangent. Show your work, and make it clear what you are calculating.

The function $g(x)$ has a horizontal tangent at $x = \underline{\hspace{10cm}}$.