Name: ——————————————————————— —————— / 25

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

1. **[9 points]** For each function below, find its derivative. You do not need to simplify your answer.

   a. $f(x) = \sqrt{3x} + x^e + \frac{4}{3x^2}$

   b. $h(x) = x^{-1/3}e^x$

   c. $g(x) = \frac{x+1}{x^3+2}$

2. **[4 points]** For what x-values does $f(x) = ax^3 - bx + c$ have a horizontal tangent? (Assume a, b, and c are positive real numbers.)

3. [8 points] Suppose that $f(2) = 5$, $f'(2) = 3$, $g(2) = -1$, and $g'(2) = 6$. Find the following values:

    a. $(f+g)'(2) =$

    b. $(10f - g)'(2) =$

    c. $(fg)'(2) =$

    d. $\left(\frac{f}{g}\right)'(2) =$

4. [4 points] Find an equation of the tangent line to the curve $y = 10x - \frac{2}{x}$ when $x = 1$.