**Name:** _____ _____ / **12**

- There are 12 points possible on this proficiency: **One point per problem. No partial credit.**
- A passing score is 10/12.
- You have 30 minutes to complete this proficiency.
- No aids (book, calculator, etc.) are permitted.
- You do **not** need to simplify your expressions.
- Your final answers **must start with** $f'(x) =$, $dy/dx =$, or similar.
- Circle your final answer.

**Compute the derivatives of the following functions.**

1. $f(x) = \dfrac{x - \ln 2}{5} - \sqrt[3]{x}$

2. $g(x) = \dfrac{1}{\sin(x)}$

3. $f(t) = \dfrac{1 - 4t^{\frac{1}{2}} + t^3}{t}$

4. $h(x) = e^{-x/4}\cos(x)$

5. $y = \arcsin\left(2x + \sqrt{6}\right)$

6. $f(x) = x^k + e^{-kx}$, where $k$ is a fixed constant

7. $y = \dfrac{\tan(x)}{1+\ln(x)}$

8. $h(x) = \dfrac{\pi}{x^2} + \left(\dfrac{x-1}{4}\right)^3$

9. $y = \sin^2\left(x - \sqrt{x^2+1}\right)$

10. $y = e^x \ln(x) \sec(x)$

11. $g(x) = \dfrac{\cos(2x)}{x^3 + x}$

12. Compute $dy/dt$ if $\quad e^y + t^3 = y\cos(y)$. You must solve for $dy/dt$.