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

2. $h(x) = e^{-x/3}\cos(x)$

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

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

5. $y = \arccos\left(2x^{1/4} + \sqrt{6}\right)$

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

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

8. $y = e^x \ln(2x)\sec(x)$

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

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

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

12. Compute dy/dt if $\quad ye^y + 5 = 2\sin(y)t^3$. You must solve for dy/dt.