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

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

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

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

5. $h(z) = e^{-z/4}\sin(z)$

6. $y = \arccos\left(2x + \sqrt{7}\right)$

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

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

9. $y = e^x \tan(x) \ln(x)$

10. $y = \sin^3\left(x - \sqrt{x^2+1}\right)$

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

12. Compute dy/dt if $\quad y\cos(y) = e^y + t^2$. You must solve for dy/dt.