Name: _____

- There are 12 points possible on this proficiency, one point per problem. **No partial credit will be given.**
- A passing score is 10/12.
- You have one hour 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 or box your final answer.**

1. [12 points] Compute the derivatives of the following functions.

a. $f(x) = \sqrt{1+x^3}$

b. $f(x) = \dfrac{e^x}{x^3}$

c. $f(x) = \left(\ln(x^2+e^2)\right)^5$

d. $f(x) = \dfrac{1}{2x} + \sqrt{2x}$

e. $f(x) = a^{\sin(x)}$ where a is a constant, $a > 1$

f. $f(x) = \sqrt{x + \ln(2x)}$

g. $f(x) = 1 - x^2 + \sin(1.7x)$

h. $y = \sin^{-1}(\sqrt{x})$

i. $f(x) = \sec\left(\dfrac{x}{x+1}\right)$

j. $f(x) = \dfrac{x\ln(x)}{2}$

k. $f(x) = e^{\pi x+1} + \sqrt{3}\tan(\pi x)$

l. Find $\dfrac{dy}{dx}$ for $2x + y = \cos(xy)$. You must solve for $\dfrac{dy}{dx}$.