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 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 or box your final answer.**

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

a. $f(x) = \dfrac{\cos x}{x^3}$

b. $f(x) = e^{(4-x^5)}$

c. $f(x) = (\sin(4x) + e^x)^{6/5}$

d. $f(x) = \ln(\sec x + \tan x)$

e. $f(x) = \dfrac{x^3}{2} + \dfrac{7}{\sqrt{x}} + \sqrt{30}$

f. $f(x) = \log_b(x \cos x)$ (where $b > 1$)

g. $f(x) = \dfrac{1+x^4}{x\tan(\pi/3)}$

h. $y = \pi\left(\dfrac{x+8}{5}\right)^2$

i. $f(x) = \arctan(\sqrt{x})$

j. $f(x) = x^2 \ln(6 + \frac{x}{6})$

k. $f(x) = x^{0.7} + e^2 + e^{-x}$

l. Find $\frac{dy}{dx}$ for $x^2 + y^2 = 25 + 2xy^3$. You must solve for $\frac{dy}{dx}$.