Name: _____

- There are 12 points possible on this proficiency, one point per problem. **No partial credit will be given.**
- You have 60 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. $f(x) = x\cos x$

b. $f(x) = e^{7-x^5}$

c. $f(x) = \sqrt{5x - \ln(4x)}$

d. $f(x) = \dfrac{\sin(x/2)}{x^6}$

e. $f(x) = \dfrac{1}{8x} + \sqrt{7-x} + 9^4$

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

g. $\tan^{-1}(x^4)$

h. $f(t) = \dfrac{t \ln t}{\ln 3}$

i. $f(x) = \log_5(x^3)$

j. $f(x) = \pi \sin\left(\dfrac{9+x}{12}\right)$

k. $f(x) = (\cos(x^4 + e^4))^2$

l. Find $\dfrac{dy}{dx}$ for $2y - 1 = ye^x - 2x$. You must solve for $\dfrac{dy}{dx}$.