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. $f(x) = x \sin x$

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

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

d. $f(x) = \dfrac{\cos(x/3)}{x^5}$

e. $f(x) = \dfrac{1}{9x} + \sqrt{6-x} + 6^9$

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

g. $\tan^{-1}(x^3)$

h. $f(t) = \dfrac{t \ln t}{\ln 2}$

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

j. $f(x) = \pi \cos\left(\dfrac{8+x}{12}\right)$

k. $f(x) = (\sin(x^3 + e^3))^5$

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