Name: ———————————————————————

- There are 12 points possible on this proficiency, one point per problem. **No partial credit will be given.**

- 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** $f'(x) =$, $\frac{dy}{dx} =$, or similar.

- Draw a box around your final answer.

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

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

b. $f(x) = \dfrac{1}{4x} + \sqrt{4x}$

c. $f(x) = \dfrac{\sin(x)}{\cos(x)}$

d. $f(x) = e^{(x^3 - 4x^2 + 7)}$

e. $f(x) = \dfrac{\cos(x/2)}{2x^4}$

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

g. $f(x) = \sqrt{x + \ln(3x)}$

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

i. $y = \pi \left(\dfrac{1+x}{2} \right)^4$

j. $f(x) = \left(\cos(x^2 + e^2)\right)^5$

k. $f(x) = \tan^{-1} x$

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