Name: _____

- There are 12 points possible on this proficiency, one point per problem. **No partial credit will be given.**
- You have 1 hour to complete this proficiency.
- No aids (book, calculator, etc.) are permitted.
- You do **not** need to simplify your expressions.
- Correct parenthesization is required.
- 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. $f(\theta) = \sin(3\theta^5 + 2\theta + 1)$

b. $p(x) = \dfrac{3}{\sqrt{2x}} + \left(\dfrac{x+8}{3}\right)^2$

c. $h(x) = \cot(x)$

d. $f(x) = \arcsin(x^{-2})$

e. $f(t) = \sqrt{t + \cos^3(t)}$

f. $f(x) = x^{5/3}\sec(x)$

g. $f(x) = \dfrac{x}{x+\tan(x)}$

h. $g(x) = (\sin(\ln(x)))^6$

i. $f(x) = e^{5x}(2-x)$

j. $k(x) = \dfrac{x^2 \ln(x) + 5}{x}$

k. $f(x) = x^p + \ln(ax+3)$ (Assume p and a are fixed positive constants.)

l. Find $\dfrac{dy}{dx}$ for $\quad x + y + \pi = ye^x$