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.
- You must show sufficient work to justify your final expression. A correct answer for a nontrivial computation with no supporting work will be marked as incorrect.
- 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. $f(t) = 4t^9 + \dfrac{5}{t} + \sqrt{\dfrac{3}{7}}$

b. $g(x) = \ln(7x^2) + \cot(x)$

c. $y = e^{2x^3-4}\cos(6x-8)$

d. $h(x) = \dfrac{5\csc(3x)}{11e^x + \sqrt{2}}$

e. $j(\theta) = \ln(\tan(\theta) + \sin(4\theta))$

f. $f(x) = 3^x(Ax+B)^{-1/2}$, where A and B are fixed constants

g. $y = \pi \sec(x) + \ln(2)$

h. $k(t) = \dfrac{t^2 - 5t + 6}{t^{3/2}}$

i. $f(h) = \dfrac{h + \log_5(h^2)}{8}$

j. $y = \sqrt[3]{e^2 + e^{\sin(x)}}$

k. $f(x) = \arctan(6x)$ (this is the same as writing $f(x) = \tan^{-1}(6x)$)

l. Find $\dfrac{dy}{dx}$ for $y^4 + \cos(x + y^2) = x^3 - 7$. *[You must solve for* $\dfrac{dy}{dx}$*.]*