

Name: _____

_____ / 12

- There are 12 points possible on this proficiency: **One point per problem. No partial credit.**
- A passing score is 10/12.
- 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 your final answer.

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

a. $q(t) = \left(\sqrt{1+t^4}\right) \ln(t)$

b. $f(x) = \frac{1}{\cos(5x)}$

c. $s(t) = \frac{\sin(2t)}{3+t^2}$

d. $f(x) = (x^2 + 1)e^x \sin(x)$

e. $g(z) = \cos(z^4 + \pi)$

f. $f(t) = \frac{4}{t^{1/3}} + 2t^{1/3} + \sqrt{\frac{1}{3}}$

g. $f(x) = \frac{3x+7}{3\ln x + \ln 7}$

h. $g(x) = \arcsin(e^x)$

i. $g(x) = (e^{2x} + e) \tan(x)$

j. $h(x) = \ln(A + B \sin(x^2))$, where A and B are fixed constants

k. $r(x) = \sec(x^2 + 1)$

l. Compute $\frac{dy}{dx}$ if $xy + 2 \sin y = e^{x+y}$. You must solve for $\frac{dy}{dx}$.