

Name: \_\_\_\_\_

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- 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.  $u(x) = (e^2 + e^x)(7 - x^{-5})$

2.  $f(t) = \frac{1}{\sqrt[3]{t}} + \left(\frac{2 + \pi t}{3}\right)^4$

3.  $g(y) = \frac{\tan(y^2)}{1 + \sin(y)}$

4.  $y = (2x^2 + 4) \arctan(x)$  (note  $\arctan(x) = \tan^{-1}(x)$ )

5.  $h(x) = \frac{x^5 - ax + b}{x^2}$  (where  $a$  and  $b$  are constants)

6.  $G(x) = e^{\cos(x^2)+2}$

7.  $g(u) = \ln(2) + \ln(u) - \ln(u^2)$

8.  $f(\theta) = 2 \sin(\theta^3 + 2)$

9.  $k(x) = e^{3x} \cos(2x)$

10.  $F(x) = \csc(x) + (\sqrt{2})x$

11.  $g(t) = \frac{6}{\cos(t)}$

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