Chapter 5 Practice Test

Name:__________________
Show all work to receive full credit. Use correct notation.

1. Find \( g'(x) \) for \( g(x) = \ln \frac{e^x}{e^x - 4} \). (4 pts.)

2. Find the slope of the tangent line to the curve of \( y = \ln \left( \frac{x^3}{x - 1} \right) \) at the point where \( x = 4 \). (3 pts.)

3. Evaluate \( \int \frac{x}{x^2 + 9} \, dx \). (5 pts.)

4. Find the equation of the tangent line to the graph of \( x^2 + \ln(x+1) + y^2 = 4 \) at \( (0,2) \). (5 pts.)
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5. Find the particular solution of the differential equation that satisfies the initial conditions for $f''(x) = \sin x + e^{2x}$, $f'(0) = \frac{1}{2}$, $f(0) = \frac{1}{4}$. (7 pts.)

6. Evaluate $\int \frac{x^3}{x^2 + 1} dx$. (6 pts.)

7. Find $y'$ if $y = \arcsin t^2$. (5 pts.)

8. Find $\int 7^{5x^3} dx$. (7 pts.)

9. $f(x)$ and $g(x)$ are inverse functions. $f'(3) = 5$ and $g'(5) = \frac{3}{4}$. What is the value of $f'(3)$?