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.

Compute the derivatives of the following functions.

1. $f(x) = \ln(3) - \dfrac{1}{x^2}$

2. $y = e^{(ax^2)} + bx^3$, where a and b are fixed constants

3. $g(x) = \left(\dfrac{1}{x} - x^2\right)(x-1)^3$

4. $h(y) = (y + \ln(y))^{3/2}$

5. $r(\theta) = \dfrac{1}{\cos(\theta)}$

6. $f(x) = \dfrac{\cos(\pi x)}{e^{3x} - 1}$

7. $y = e^{-x}\tan(3x)\sin(x-\pi)$

8. $g(t) = \dfrac{t^2 - t^3 + 3t^{1/2}}{t^{1/2}}$

9. $f(x) = \ln(e^x + \sqrt{5})$

10. $f(x) = \left(\sqrt{1-x^2}\right) \arcsin(x)$

11. $s(t) = \tan\left(\ln\left(-t^3\right)\right)$

12. Compute dy/dx if $\ln(y) + xy^2 = x^2 - 1$. You must solve for dy/dx.