Name: ―――――――――――――――――――――   ――――――― / 12

Instructor: Bueler | Jurkowski | Maxwell

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

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

3. $y = e^{3x} \sec(x)$

4. $h(t) = \ln(t^2 + \ln(t))$

5. $f(x) = \dfrac{3}{x} + \dfrac{x}{\ln(3)}$

6. $r(\theta) = \sqrt{\cos(\theta)}$

7. $f(x) = (x^2 - 5)(\tan x + \sqrt{7})$

8. $y = ax^b \ln(x) \sin(\pi x)$ where a and b are fixed constants.

9. $g(t) = \dfrac{2\sin(t)}{\cos(t)}$

10. $f(x) = \dfrac{1 - 2x^4}{\sqrt{x} + e^x}$

11. $y = e^{\arcsin(2x)}$

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