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. $f(x) = \sqrt{8} - \sin(3x)$

2. $f(x) = x^3 \cos(x)$

3. $y = \dfrac{t^3 - 3t^2 - t^{\frac{1}{3}}}{t}$

4. $y = \dfrac{1}{\cos(x)}$

5. $g(r) = \sqrt{1 + r^a}$ where a is a fixed constant.

6. $h(w) = \sec\left(\frac{w}{1+w}\right)$

7. $v(\theta) = \dfrac{\sin(\theta)}{\theta}$

8. $f(x) = (1-x^2)e^{\sin(\pi x)}$

9. $y = x^3 \tan(x) \ln(x)$

10. $y = \arctan(\ln(1-3x))$

11. $y = \sin(x)\cos(1-3x^2)$

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