

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 30 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. $f(x) = \pi x^{1/3} - 2e^x + \ln 7$

2. $y = (x - x^2) \sin(x)$

3. $f(t) = \frac{t^2 - t + 4t^{1/2}}{t^{1/2}}$

4. $f(t) = b + t^2 \ln(at)$

5. $f(x) = \frac{1}{\cos(x)}$

6. $f(x) = \frac{\cos(x)}{1 + \sin(3x)}$

7. $f(x) = \sec(x)x^{\frac{1}{3}}e^{4x}$

8. $f(z) = \arctan(\sqrt{z} + \sqrt{5})$

9. $f(t) = \tan(\ln(t^3 - 1))$

10. $f(x) = \frac{1}{7x^2} + \left(\pi \frac{x-5}{4}\right)^3$

11. $f(x) = \cos^5(x^2 - x)$

12. Compute dy/dx if $x^2y - 3 = e^y \sin(x)$. You must solve for dy/dx .