

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

2. $r(\theta) = \frac{1}{\sin(\theta)}$

3. $f(x) = \sqrt{6} - \frac{1}{x^3}$

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

5. $s(t) = \tan(\ln(-t^2))$

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

7. $h(y) = (\ln(y) + y)^{5/4}$

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

9. $y = \ln(x) \tan(3x) \cos(x - \pi)$

10. $f(x) = \ln(e^x + \ln(3))$

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

12. Compute dy/dx if $x^2 - 3 = e^y + xy^2$. You must solve for dy/dx .