Name: _____ _____ / **12**

- There are 12 points possible on this proficiency: one point per problem with no partial credit.
- 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 should start with $f'(x) =$, $dy/dx =$ or something similar.
- $\boxed{\text{Box}}$ your final answer.

1. $f(t) = e^t(3-t^4)$

2. $r(\theta) = \tan\left(\sqrt{3}+\theta^2\right)$

3. $g(z) = (3z-4)(z^2+7)$

4. $f(x) = \dfrac{3}{\cos x}$

5. $f(r) = \dfrac{r^3 + \sqrt{r} - 2}{r}$

6. $G(x) = \left(\dfrac{x - \ln(4)}{2}\right)^3 + x\sqrt{x+1}$

7. $f(y) = e + \cos(y^{\pi})$

8. $f(x) = \dfrac{2\sec(bx)}{3x^3}$ (where b is a constant)

9. $y = x^{1/4}e^{-x}\sin(x)$

10. $y(t) = \ln(2t + \sin(t^2))$

11. $g(x) = \arctan(e^{3x})$

12. Compute $\frac{dy}{dt}$ if $\ln y - 5t = t^2 y$. You must solve for $\frac{dy}{dt}$.