Name: ―――――――――――――――――――――――――――――

Rules: Circle your instructor:

○ One point per problem, 12 points total.   Leah Berman
○ **No partial credit**.
○ Time to complete: 1 hour.   Jill Faudree
○ No aids (book, calculator, etc.) permitted.
○ You do **not** need to simplify your expressions.   James Gossell
○ Show sufficient work to justify your final expression.
○ Final answers **must start with** $f'(x) =$, $\frac{dy}{dx} =$, or similar.

Compute the derivatives of the following functions. Each problem is worth 1 point for a total of 12 points.

1. $y = e^{x/2} \sin(1 - 4x)$

2. $f(x) = \dfrac{x - \ln(2)}{5} - \dfrac{1}{6x}$

3. $L(t) = \ln(t^2 + \cos^2(t))$

4. $y(x) = \dfrac{\pi \sec(x)}{1 + \ln(x)}$

5. $j(\theta) = \tan(\theta - \sqrt[3]{\theta^2 + 1})$

6. $y = 4\log_{10}(x^2) + (\sin(x))^{-5}$

7. $x(\theta) = \arcsin(2\theta)$ (Note: $\arcsin(2\theta)$ is the same as $\sin^{-1}(2\theta)$)

8. $u(x) = (e^2 + e^x)(\sqrt{6} - x^2)$

9. $f(x) = \dfrac{1}{x^2 + 1} + \dfrac{1}{\tan(x)}$

10. $y = \sqrt{\dfrac{2^x}{x^3}}$

11. $f(x) = x^k + e^{-kx} + 2k$, where k is a fixed constant

12. Find $\dfrac{dy}{dx}$ for $x^2 y^2 + 2x = 2 + \ln(y)$. *[You must solve for $\dfrac{dy}{dx}$.]*