Name: _____

1. **[12 points]** Compute the derivatives of the following functions.

   a. $f(x) = e^{(\sin(x))}$

   b. $f(x) = \dfrac{x^2 - x}{\cos(x)}$

   c. $f(x) = \ln(x^2 - e^x)$; $f(x) = (\sec(x) + x)^2$; $f(x) = \tan(x^3)$;

   d. $f(x) = \dfrac{x^{1/2}}{2} + \dfrac{2}{\sqrt[3]{x}} + \dfrac{1}{\sqrt{5}}$

   e. $f(x) = \log_5(x^b \cos x)$ (where $b > 1$);

   f. $f(x) = \left(e^{x/7} + \cos(x)\right)^{3/4}$

g. $y = 8\left(\dfrac{\pi - x}{2}\right)^8$

h. $f(x) = \arctan(3x)$; $f(x) = \arcsin(3x)$

i. $f(x) = \dfrac{4^x}{x\sin(4)}$

j. $f(x) = (\ln(4 + x + x^2))^3$

k. $f(x) = e^{-3x} + e^2 + x^\pi$

l. Find $\dfrac{dy}{dx}$ for $x^3 + e^y = 25 + y\sin(x)$. You must solve for $\dfrac{dy}{dx}$.