Quiz #6
Applied Calculus I – Math 131.009 – Fall 2012

Names: ____________________________

Show your work for credit.

1. (1 pt) The graphs $g$ and $f$ are shown in Figures 3.12 and 3.13, respectively. Note that $f'(0) = 0$, $g'(2) = 0$, and $g(4) = 0$. Use calculus (e.g., definition of derivative, or maybe the chain rule) to determine which of (a)–(d) represents $f(g(x))$.

![Figure 3.12](image1)

![Figure 3.13](image2)
2. (4 pts) Compute the indicated derivatives:

(a) \[ \frac{d}{dt} e^{2t + \ln t} \]

\[ (2 + \frac{1}{t}) e^{2t + \ln t} \]

(b) \( f''(\pi/6) \) if \( f(\theta) = \sin 3\theta \)

\[ f'(\theta) = 3 \cos 3\theta \]

\[ f''(\theta) = -9 \sin 3\theta. \]

\[ f''(\pi/6) = -9 \sin \left( \frac{\pi}{2} \right) = -9 \]

(c) \[ \frac{d}{dw} \frac{\ln[(w^2 + 1)^3]}{(w^2 + 1)^3} \]

\[ \text{quotient rule} \]

\[ \left[ \frac{1}{(w^2 + 1)^3} \left( 3(w^2 + 1)^2 (2w) \right) \right] (w^2 + 1)^3 - \frac{\ln[(w^2 + 1)^3]}{(w^2 + 1)^3} \left[ 3 (w^2 + 1)^2 (2w) \right] \]

\[ \frac{\left( (w^2 + 1)^3 \right)^2}{(w^2 + 1)^3} \]