Prof. Haiman | Math 1A—Calculus | Fall, 2006

Quiz 6 solutions—version A

Name _____ Student ID Number _____

1. Differentiate the following functions of x

(a)

$$(\sin x)^{1/x}$$

$$(\sin x)^{1/x}\left(\frac{-\ln\sin x}{x^2}+\frac{\cot x}{x}\right)$$

(b)

$$\cosh(\sinh x)$$

$$\sinh(\sinh x)\,\cosh x$$

2. Find $\left(\frac{d}{dx}\right)^{99}(2e^x+3e^{-x})$

The higher derivatives alternate between $2e^x+3e^{-x}$ and $2e^x-3e^{-x}$. Since 99 is odd, the 99-th derivative is $2e^x-3e^{-x}$.

3. If P, Q and R are functions of t that satisfy the equation $PQR=6$, find R and R' when $P=1$, $Q=2$, $P'=7$, $Q'=-6$.

Using $PQR=6$, find $R=3$.
Then, using $P'QR+PQ'R+PQR'=0$, find $R'=-12$.