quiz 13
math1117.07
u new haven
m 28 oct

name: Solution

1 (4 points each). Find the derivatives for the following functions

(a) $y = \dfrac{x\sin(x)}{1+\cos(x)}$

(b) $y = \dfrac{\sin(x)+\cos(x)}{e^x}$

(c) $y = \sec(x)\tan(x)$

a) $y' = \dfrac{\frac{d}{dx}(x\sin(x))(1+\cos x) - (x\sin(x))\frac{d}{dx}(1+\cos x)}{(1+\cos x)^2}$

$= \dfrac{(\sin(x)+x\cos(x))(1+\cos(x)) + (x\sin(x))(\sin(x))}{(1+\cos(x))^2}$

b) $y' = \dfrac{\frac{d}{dx}(\sin(x)+\cos(x))e^x - (\sin(x)+\cos(x))\frac{d}{dx}(e^x)}{(e^x)^2}$

$= \dfrac{(\cos(x)-\sin(x))e^x - (\sin(x)+\cos(x))e^x}{e^{2x}}$

$= -2\sin(x)e^{-x}$

c) $y' = \frac{d}{dx}(\sec(x))\tan(x) + \sec(x)\frac{d}{dx}(\tan(x))$

$= (\sec(x))(\tan(x))^2 + (\sec(x))^3$