**quiz 11**
math1117.02
u new haven
*23 oct 2019*

name: Solution

**1.** Find the derivatives for the following functions (3 points each)

*(a)* $g(x) = 6x - 2xe^x$ *(b)* $f(x) = \dfrac{2e^x - 1}{2e^x + 1}$ *(c)* $h(w) = \dfrac{w^2 - 1}{w^2 + 1}$

(a) $g'(x) = \frac{d}{dx}(6x) + \frac{d}{dx}(-2xe^x)$

$= 6 - \left(\frac{d}{dx}(2x)\cdot e^x + 2x\frac{d}{dx}(e^x)\right)$

$= 6 - 2e^x - 2xe^x$

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(b) $f'(x) = \left(\dfrac{\frac{d}{dx}(2e^x-1)(2e^x+1) - (2e^x-1)\frac{d}{dx}(2e^x+1)}{(2e^x+1)^2}\right)$

$= \left(\dfrac{2e^x(2e^x+1) - 2e^x(2e^x-1)}{(2e^x+1)^2}\right) = \left(\dfrac{4e^x}{(2e^x+1)^2}\right)$

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(c) $h'(w) = \left(\dfrac{\frac{d}{dw}(w^2-1)(w^2+1) - (w^2-1)\frac{d}{dw}(w^2+1)}{(w^2+1)^2}\right)$

$= \left(\dfrac{(2w)(w^2+1) - (w^2-1)(2w)}{(w^2+1)^2}\right) = \left(\dfrac{4w}{(w^2+1)^2}\right)$