

Last Name: SOLUTIONS

First Name: _____

Student ID: _____

Quiz 6 (A)

Question 1. Find the derivatives of the following functions (do not simplify):

(a) (2 marks) $f(x) = \frac{\sqrt{x}+1}{x^2+1}$

$$f'(x) = \frac{\frac{d}{dx}[\sqrt{x}+1] \cdot (x^2+1) - (\sqrt{x}+1) \cdot \frac{d}{dx}[x^2+1]}{(x^2+1)^2}$$

$$= \frac{(\frac{1}{2}x^{-1/2})(x^2+1) - (\sqrt{x}+1)(2x)}{(x^2+1)^2}$$

(b) (4 marks) $f(t) = (2t-1)^4 + (2t+1)^4$

$$f'(t) = 4(2t-1)^3(2) + 4(2t+1)^3(2)$$

(c) (4 marks) $f(x) = \frac{1}{\sqrt{2x^2-1}} = (2x^2-1)^{-1/2}$

$$f'(x) = -\frac{1}{2}(2x^2-1)^{-3/2} \cdot (4x)$$