

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

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

(b) (4 marks)  $f(x) = \sqrt{(x+3)(x^2-1)}$

$$\begin{aligned} f'(x) &= \frac{1}{2} [(x+3)(x^2-1)]^{-1/2} \cdot \frac{d}{dx} [(x+3)(x^2-1)] \\ &= \frac{1}{2} [(x+3)(x^2-1)]^{-1/2} [(1)(x^2-1) + (x+3)(2x)] \end{aligned}$$

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

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