Quiz 5

MATH 11A - Discussion Section C
February 27, 2017

Name & ID # : _____

Directions: Leave your final answer in exact form and box it in. You are more than welcome to write on the back if you find it necessary.
Differentiation Shortcuts: You may find the following helpful:

$$\left(\frac{f}{g}\right)' = \frac{f'g - fg'}{g^2}, \quad (f(g))' = f'(g) \cdot g', \quad \frac{d}{dx}\tan(x) = \sec^2(x), \quad \text{and} \quad \frac{d}{dx}\arctan(x) = \frac{1}{1+x^2}$$

and the linearization of a function at $x = x_0$ is given by:

$$L(x) = f(x_0) + f'(x_0)(x - x_0)$$

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(1) Find the derivative of the following functions:

a) $f(x) = (\tan(x))^{\frac{1}{x}}$

b) $g(x) = (\arctan(x))^2$

(2) Find the linearization (linear approximation), $L(x)$, at $x = x_0$ of the function $f(x) = x^4 + 3x^2$ where $x_0 = -1$.