

Quiz 2- MAC 2311, F'16 NAME: _____ Panther ID: _____

1. Find the indicated derivative. Simplify the answer when possible.

(a) If $\lambda = \left(\frac{au+b}{cu+d}\right)^6$, where a, b, c, d are constants, find $\frac{d\lambda}{du}$.

(b) If $y = \cos(\sin(\sqrt{\pi x}))$ find $\frac{dy}{dx}$.

2. Find the equation of the tangent line to the graph of $f(x) = \cot^4 x$ at $x = \pi/4$.

3. Show that the function $y = \sin(x^2)$ satisfies the differential equation $y'' - \frac{y'}{x} + ax^2y = 0$, for a certain constant a that you should determine.

4. For each of the following implicitly defined functions, find $\frac{dy}{dx}$:

(a) $y^4 - 3y^3 - x = 3$

(b) $\cos(xy) = x - y$

5. Consider the function implicitly defined by $y^4 = x + y$.

a) Find an expression for the derivative $\frac{dy}{dx}$.

b) Find the equation of the line tangent to this function at the point (0,1).

c) Find where the tangent line is vertical.