

MATH 31 - Calculus. Homework 5. Due Th. 10/15/2026. Professor Luis Fernández

NAME: _____

Do not write your answers here.

Write your answers in other sheets and **STAPLE them to this one.**

1. Use implicit differentiation to find an equation of the tangent line to the curve $y^2(6-x) = x^3$ at the point $(2, \sqrt{2})$.
2. Consider the equation $\sqrt{x} + \sqrt{y} = \sqrt{18}$.
 - (a) Find the equation of the tangent line to the curve at the point $(2, 8)$ in the curve.
 - (b) Find the x and y intercepts of the tangent line you got in part 1.
 - (c) Show that the sum of the intercepts is always equal to 18.
3. Suppose that f and g are differentiable functions that satisfy $f(g(x)) = x$ for all x . Also suppose that $g(4) = 3$ and that $f'(3) = 7$. Find $g'(4)$.
4. **Challenge! (+2 extra credit)** Consider the equation $\sqrt{x} + \sqrt{y} = \sqrt{c}$ (c is a given constant).
 - (a) Find the equation of the tangent line to the curve at a point (a, b) in the curve (the expression you will get will be written using a , b and c).
 - (b) Find the x and y intercepts of the tangent line you got in part 1.
 - (c) Show that the sum of the intercepts is always equal to c .