

Name: Key

Calculus 251:C3 Quiz #9 - 6/10/2020 Topic: Section 14.6

Instructions. Answer the questions in the spaces provided or on your own paper, then scan and upload to Canvas. Show and label all of your work. Responses with no work may receive no credit even if the answer is correct.

10 pts

(1) Suppose that x , y , and z are implicitly related by the equation $x^2y^2 + xz^3 + yz^2 = 4$.

Calculate $\frac{\partial z}{\partial x}$ and $\frac{\partial z}{\partial y}$.

$$x^2y^2 + xz^3 + yz^2 = 4$$

Diff w.r.t. x :

$$2xy^2 + z^3 + 3xz^2z_x + 2yz z_x = 0$$

$$z_x(3xz^2 + 2yz) = -(2xy^2 + z^3)$$

$$z_x = -\frac{2xy^2 + z^3}{3xz^2 + 2yz}$$

Diff w.r.t. y :

$$2x^2y + 3xz^2z_y + z^2 + 2yz z_y = 0$$

$$z_y(3xz^2 + 2yz) = -(2x^2y + z^2)$$

$$z_y = -\frac{2x^2y + z^2}{3xz^2 + 2yz}$$