

Names: _____

Worksheet 2-17

MAC-2313

Spring 2022

1. (6 pts) Let $z = x^2 + xe^{-y^2}$. Find each of the following:

(a) $\frac{\partial z}{\partial x} =$

(b) $\frac{\partial z}{\partial y} =$

(c) $\frac{\partial^2 z}{\partial y^2} =$

2. (3 pts) The temperature at a point (x, y) on a metal plate in the xy -plane is given by $T(x, y) = 2x^2 - y^3 + x$ degrees Celsius. Assume x, y are measured in centimeters.

(a) (1 pt) What is the temperature at the point $(2, 1)$?

(b) (2 pts) What is the rate at which the temperature changes with respect to distance if we start at the point $(2, 1)$ and move parallel to the x -axis in the direction of increasing x ? Give units to your answer.

3. (2 pts) Specify the domain of the function $f(x, y) = 4 - x^2 - y^2$ and sketch its graph.