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Quiz 10/04

MAC-2313

Fall 2018

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.