Name: _____ **Panther ID:** _____

Quiz 02/20/2020 MAC-2313

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

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

(b) $\dfrac{\partial^2 z}{\partial x^2} =$

(c) $\dfrac{\partial^8 z}{\partial y^3 \partial x^5} =$

2. (5 pts) The temperature at a point (x, y) on a metal plate in the xy-plane is given by $T(x, y) = 2x^2 + 3x - 3y^2$ degrees Celsius.

(a) (1 pt) What is the temperature at the point $(2, 0)$?

(b) (1 pt) An ant is moving on the metal plate so that at time t (in seconds) its position is given by $(x(t) = 2\cos t, y(t) = \sin t)$. In one sentence, describe the trajectory of the ant.

(c) (3 pts) What temperature does the ant experience at $t = \pi/2$ seconds and what is the rate of change of temperature with respect to time at that moment?