

Name: _____

Math 234 Quiz 4

Section: 328

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Sep 30, 2014

1. Let $f(x, y) = e^{-x^2-y^2}$.

(1) (5 pts) Compute the gradient of f at $(1, 1)$.

(2) (2 pts) In which direction does f decrease fastest at $(1, 1)$?

(3) (5 pts) Find the linear approximation of f at $(1, 1)$.

(4) (3 pts) Use (3) to estimate $f(1.1, 1.1)$. (Note that $e^{-2} \approx 0.14$).

(5) (5 pts) Find the equation of the tangent plane to the graph of f at $(1, 1)$.

(6) (3 pts) Find the equation of the tangent line to the level curve of f at $(1, 1)$.

(7) (2 pts) Sketch the graph of f .

The last two questions are for bonus.