

APPM 2350 Final Exam
Saturday, Dec 11th 7:30am-10am 2021

Show all your work and simplify your answers. Answers with no justification will receive no points. No calculator, smartphone, smartwatch, or any other electronic device is permitted.

Answer the following questions. You can use any method you wish, including derivatives.



(9, 16) TJ/F53 10.9091

Use the gradient of the function $f(x, y)$ (no credit will be given). Use ONLY the gradient to answer the following questions:

1. Estimate the maximum value of f at the point $(9, 16)$ by justifying your estimate.

2. Find the direction of steepest descent of f at the point $(9, 16)$. For credit, show work justifying or explaining your answer.

Problem 3(25 points)

A metal plate lies in the xy -plane in the region $x = 4 - y^2$
(i.e the region in quadrants I and IV bounded by the