MA 261
Exam 2

READ THIS PAGE COMPLETELY

1. Verify that all exam pages are present. There should be 11 problems. Each problem is worth 9 points. Make sure the cover of your exam matches the color of the mark-sense sheet (scantron).

2. Fill out your last name, first name, division/section number, and student ID number (PUID) on the corresponding boxes of the mark-sense sheet (scantron) and make sure you blacken the corresponding bubbles.

3. For each question, circle the correct answer on the question sheet. Fill in the corresponding bubble on the mark-sense sheet (scantron).

4. There is no penalty for wrong answers. Be sure to answer every question.

5. Turn in all materials given to you when finished.

6. No notes, books, or calculators allowed.

PLEASE PRINT

Name: _____

PUID number: _____

SIGN your name: _____

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3 Second Derivatives Test Suppose the second partial derivatives of f are continuous on a disk with center (a, b), and suppose that $f_x(a, b) = 0$ and $f_y(a, b) = 0$ [that is, (a, b) is a critical point of f]. Let

$$D = D(a, b) = f_{xx}(a, b)f_{yy}(a, b) - [f_{xy}(a, b)]^2$$

(a) If $D > 0$ and $f_{xx}(a, b) > 0$, then $f(a, b)$ is a local minimum.
(b) If $D > 0$ and $f_{xx}(a, b) < 0$, then $f(a, b)$ is a local maximum.
(c) If $D < 0$, then $f(a, b)$ is not a local maximum or minimum.

NOTE 1 □ In case (c) the point (a, b) is called a **saddle point** of f and the graph crosses its tangent plane at (a, b).