

**MATH 20C: FUNDAMENTALS OF CALCULUS II**  
**QUIZ #8**

Name:

Please complete the following problem(s) in the space provided. You may use an approved calculator. You will have 15 minutes to complete the quiz.

Please include all relevant intermediate calculations and explain your work when appropriate.

**Problem 1.**

(a) Find  $\frac{\partial f}{\partial x}$  and  $\frac{\partial f}{\partial y}$  for

$$f(x, y) = \frac{1}{4xy^2 + 3x + 1}.$$

(b) Find  $\frac{\partial^2 f}{\partial x^2}$ ,  $\frac{\partial^2 f}{\partial x \partial y}$ ,  $\frac{\partial^2 f}{\partial y^2}$  for

$$f(x, y) = e^{xy}.$$

**Problem 2.**

(a) Find all critical points of the function

$$f(x, y) = x^2 - xy^2 + \frac{1}{5}y^5.$$

(b) Compute the Hessian

$$H = f_{xx}f_{yy} - f_{xy}^2.$$

Which of the two critical points is a local minimum?