

# Critical Points.

Spring 2016

Attendance Quizzes

February 29, 2016

# Quiz 16 Critical Points.

Consider the function:

$$f(x, y) = x^2 - 2xy + 4y^2 - 2x - 4y.$$

- ① Find  $\nabla(f(x, y))$ .

**Answer:**  $\langle 2x - 2y - 2, -2x + 8y - 4 \rangle$ .

- ② Find the critical point(s) of the function.

**Answer:**  $(x, y) = (2, 1)$ .

- ③ At the critical point, evaluate the determinant:

$$D = \begin{vmatrix} f_{xx} & f_{xy} \\ f_{yx} & f_{yy} \end{vmatrix}.$$

**Answer:**  $\begin{vmatrix} 2 & -2 \\ -2 & 8 \end{vmatrix} = 12.$