

Name: _____

Notesheet. Section 8.3: Maxima and Minima of Function of Several Variables

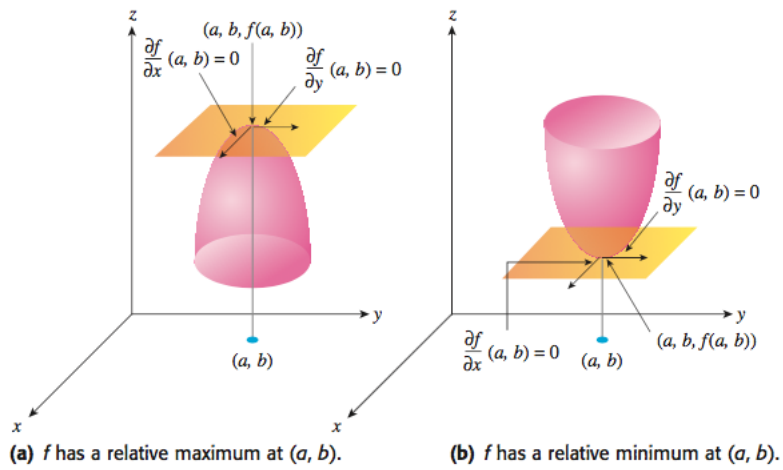
Math 1220

Definition 1. Let $f(x, y)$ be a function defined on a region R containing the point (a, b) . Then,

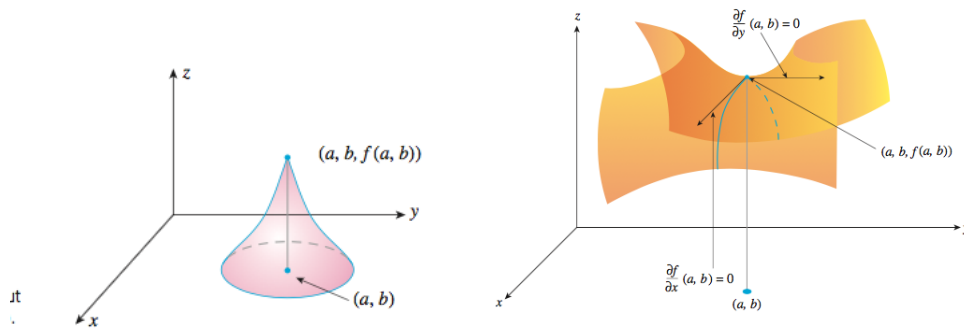
- f has a relative maximum at (a, b) with relative maximum value $f(a, b)$ if
- f has a relative minimum at (a, b) with relative minimum value $f(a, b)$ if
- f has an absolute maximum at (a, b) with absolute maximum value $f(a, b)$ if
- f has an absolute minimum at (a, b) with absolute minimum value $f(a, b)$ if

Challenge 2. Consider the function $f(x, y) = x^2 + y^2$. Does this function have any relative minima? Relative maxima? What is $f_x(0, 0)$ and $f_y(0, 0)$?

Theorem 3. If $f(x, y)$ is a differentiable function of two variables and has a relative maximum (relative minimum) at a point (a, b) in the domain of f , then



Definition 4. A critical point is a point where



Definition 5. A saddle point is a point where