

Worksheet 11**Extrema of Two Variable Functions**MATH 2210, Fall 2018

1. Decide if each statement is true or false. Give an appropriate justification for your conclusion.

(a) If $f(x, y)$ has a local maximum (with $D > 0$) at the point $(0, 0)$ then $g(x, y) = f(x, y) + x^4 - y^4$ also has a local maximum at $(0, 0)$.

(b) The function $f(x, y) = x^2 - y^2$ has an absolute minimum.

(c) If $f(x, y)$ has a critical point at $(1, 2)$ then $g(x, y) = e^{f(x,y)}$ also has a critical point at $(1, 2)$.

2. Locate and classify the critical points of

$$f(x, y) = 3y^2 + 2y^3 - 3x^2 - 6xy.$$

3. If possible find the absolute maximum and minimum values of the function $f(x, y) = 2e^{-x-y}$ on the region $R = \{(x, y) : x \geq 0, y \geq 0\}$.

4. What point on the plane $x - y + z = 2$ is closest to the point $(1, 1, 1)$?