1. (1 point) True or False: Every function has at least one local maximum.

2. (4 points) Find the critical points of $f$ and classify them as local maxima, local minima, or saddle points.

   - $f(x, y) = 5 + 6x - x^2 + xy - y^2$
3. (5 points) Use Lagrange multipliers to find the maximum and minimum values of $f$ subject to the given constraint, if such values exist.

- $f(x, y) = x^2 + y, \quad x^2 + y^2 = 1$