1. [5pts] Find the local extrema and saddle points (if they exist) of

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

2. [5pts] Use Lagrange multipliers to find the maximum and minimum of $f(x, y) = xy$ on the circle $x^2 + y^2 = 8$.