1. Find the critical points of the function $f(x, y) = xy^2 + x^2y + 8xy + 2$ on $\mathbb{R}^2$ and identify each of them as local maximum, minimum or a saddle point.

2. Minimize the cost of a rectangular aquarium with open top which should hold 24000m^3 of water. The bottom is made of steel, which costs $\$4/\text{m}^2$, two of the sides are made of thin glass, at $\$6/\text{m}^2$, and the other two are made of thicker glass, which costs $\$8/\text{m}^2$.