MATH 2934 – Additional problem assigned on 3/10/16

Additional Problem.

When you have to find the global extrema of a function f over a region D in $\mathbb{R}^2$, you have to study the critical points inside D as well as the values of f on the boundary of D. Assume that you have to find the global extremum of the function $f : D \to \mathbb{R}$, where

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

and D is the triangle bounded by the x-axis, the y-axis, and the straight line with equation

$$x + 2y = 2 \ .$$

In this problem you only have to study the values of the function f on the straight line segment connecting the points $(0, 1)$ and $(2, 0)$. First you have to parameterize this line segment, and then to find the local extrema of the function f at the points on this segment.