HOMEWORK 2

The isoperimetric problem can be stated as follows: *among all closed curves in the plane of fixed length, which curve (if any) maximizes the area of its enclosed region?*

It has been known since antiquity that the answer is a circle, but the fist valid proof was given much later. The famous geometer Jacob Steiner give a proof (actually several proofs), which in fact showed that if a solution existed, then it must be the circle. His method is now called Steiner symmetrisation. The idea is to start with a curve and to replace it with a curve of the same length but enclosing a larger area. Dirichlet, his colleague in Berlin, tried without success to convince him that his constructions do not suffice as proof, without showing the existence of a solution.

Find Steiner's arguments (on internet or in books, in modern version) and present them. So you have to show that if a solution exists, then it must be the circle.
Discuss also why this is not sufficient as proof; you do not need to complete the proof.

Solutions to be handed in at the latest Monday April 29.   js