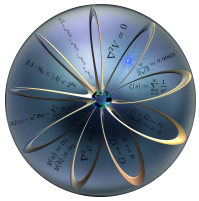

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isoperimetric problem

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The simplest of the isoperimetric problems is the following:

One must set an arc with a given length l from a given point P of the plane to another given point Q such that the arc together with the line segment PQ encloses the greatest area possible.

This task is solved in the entry example of calculus of variations.

More generally, *isoperimetric problem* may determining such an arc c between the given points P and Q that it gives for the integral

$$\int_P^Q f(x,\, y,\, y')\, ds \tag{1}$$

an extremum and that gives for another integral

$$\int_P^Q g(x,\, y,\, y')\, ds \tag{2}$$

a given value l, as both integrals are taken along c. Here, f and g are given functions.

The constraint (2) can be omitted by using the function $f-\lambda g$ instead of f in (1) similarly as in the mentionned example.