§17

Method of Lagrange multipliers

$f: \mathbb{R}^n \to \mathbb{R}$ and $g: \mathbb{R}^n \to \mathbb{R}$.

To find max/min for $f(p)$ subject to the constraint $g(p) = c$, find $p_0 \in \mathbb{R}^n$ such that

(i) $\nabla f(p_0) = \lambda \nabla g(p_0)$ for some $\lambda \in \mathbb{R}$, and

(ii) $g(p_0) = c$.

Then check $f(p_0)$ for each such p_0.

(The points p_0 are called critical points.)