

## Exercises Nr.2:

30-09-2011

L. 1.39 (*Jensen's inequality*)

Let  $f$  be a convex function defined on a convex set  $\mathcal{C} \subseteq \mathbb{R}^n$ .

Let the points  $x^1, \dots, x^k \in \mathcal{C}$  be given and let

$\lambda^1, \dots, \lambda^k \geq 0$  be such that  $\sum_{i=1}^k \lambda^i = 1$ ,  $k \geq 2$ . Then

$$\sum_{i=1}^k \lambda^i x^i \in \mathcal{C} \quad \text{and} \quad f\left(\sum_{i=1}^k \lambda^i x^i\right) \leq \sum_{i=1}^k \lambda^i f(x^i).$$

L2.4 (*Ex2.1*) Any (strict) local minimizer of a convex function  $f$  is a (strict) global minimizer.