

## Homework 8

1. Let  $f : \mathbf{R}^2 \rightarrow \mathbf{R}$  defined by  $f(\mathbf{x}) = |x_1|$ . True or False?  $f$  is a norm.
2. A function  $f : \mathbf{R}^n \rightarrow \mathbf{R}$  is convex if for each  $\mathbf{x}, \mathbf{y} \in \mathbf{R}^n$  and  $0 \leq t \leq 1$  one has  $f(t\mathbf{x} + (1-t)\mathbf{y}) \leq tf(\mathbf{x}) + (1-t)f(\mathbf{y})$ . True or False? A convex function  $f : \mathbf{R} \rightarrow \mathbf{R}$  is continuous.