Fachbereich Mathematik
Dr. L. Leuştean
K. Altmann, E. Briseid, S. Herrmann

TECHNISCHE UNIVERSITÄT DARMSTADT

20.06.2006

10. Tutorial Analysis II for MCS
Summer Term 2006

(T10.1)

Consider the normed space $(\mathbb{K}^n, \|\cdot\|_\infty)$ with $\mathbb{K} \in \{\mathbb{R}, \mathbb{C}\}$, $n \in \mathbb{N}$. Let $\emptyset \neq A \subseteq K^n$. Prove the following.

(i) A is bounded if and only if A is totally bounded.

(ii) A is compact if and only if A is closed and bounded.

(This is Proposition 6.39 in the handouts.)

(T10.2)

Let V and W be normed spaces over $\mathbb{K}$, $\mathbb{K} \in \{\mathbb{R}, \mathbb{C}\}$. Assume that V is finite dimensional. Prove that any linear transformation $T : V \to W$ is continuous.

(This is Proposition 6.46 in the handouts.)