Aufgabenblatt 3

Abgabe: 10.11.2009

Aufgabe 1 (4 Punkte)

Let $\{u_j\}$ be a sequence of distributions in $\mathcal{D}'(\Omega)$ such that the limit

$$\lim_{j \to \infty} u_j(g) =: u(g)$$

exists for all $g \in \mathcal{D}(\Omega)$. Show that $u \in \mathcal{D}'(\Omega)$.

Hint: For all u_j, the condition (C1) (cf. lecture or excercise sheet 2) can be satisfied with the same fixed C and L.

Aufgabe 2 (2 Punkte)

Show that the weak derivative of the Heaviside function

$$H(x) = \begin{cases} 1 & x \geq 0 \\ 0 & x < 0 \end{cases}$$

is the δ-distribution.