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Exercise 7 for the lecture
NUMERICS IV
SoSe 2012

Due: till Wednesday, December 12, 2012, 14 o'clock

Problem 1 (3 TP)

Show that the energy

$$J(w) = \int_{\Omega} \sqrt{1 + |\nabla w|^2} - fw$$

is not $H^1(\Omega)$ -coercive.

Problem 2 (3 TP)

Show that the mean curvature flow of graphs yields a decrease in area, i.e. show that a smooth solution u of

$$\int_{\Omega} \frac{u_t v}{Q} + \frac{\nabla u \cdot \nabla v}{Q} = 0 \quad v \in H_0^1(\Omega),$$

with $Q = \sqrt{1 + |\nabla u|^2}$, satisfies

$$\int_{\Omega} \frac{u_t^2}{Q} + \frac{d}{dt} |\Gamma(t)| = 0.$$