Math 524

Homework due 10/09/02

Reading: Sections 5, 6 and 7, Chapter 2 in Royden. Sections 1, 2 and 3, Chapter 7 in Royden. Section 6, Chapter 0 in Folland.

Problems from Royden

Chapter 2, Section 5 (page 46): problems 27, 37, 38 and 39.
Chapter 2, Section 6 (pages 49-51): problems 46 and 50.

$*$ **Problem:** Suppose that $f : \mathbb{N} \to \mathbb{R}^+$ is a function such that

$$f(n+m) \leq f(n) + f(m),$$

for all $n, m \in \mathbb{N}$. Prove that

$$\lim_{n\to\infty} \frac{f(n)}{n}$$

exists and it equals

$$\inf_n \frac{f(n)}{n}$$