

# MATHEMATICS 3210-1. Homework 6.

October 9, 2001

1. Section 10, # 10.7.
2. Section 10, # 10.9.
3. Section 10, # 10.10.
4. Let  $x_n = n(-1)^n$ . Compute  $\limsup_{n \rightarrow \infty} x_n$  and  $\liminf_{n \rightarrow \infty} x_n$ .
5. Let  $x_n = (-1)^n + 1/n$ . Compute  $\limsup_{n \rightarrow \infty} x_n$  and  $\liminf_{n \rightarrow \infty} x_n$ .
6. Suppose that  $(x_n)$  is a Cauchy sequence such that  $x_n \in \mathbb{Z}$  for each  $n$ .  
Show that there exists  $n_0 \in \mathbb{N}$  and  $z \in \mathbb{Z}$  such that  $x_n = z$  for all  $n \geq n_0$ .