

## Homework 10

Due Monday, April 9 in class (1:00pm)

Follow the same instructions given on [Homework 1](#).

(—) From the textbook: 30.2, 30.12, 30.13, 31.1, 31.3

(P1) Suppose  $X$  is a locally compact topological space and  $\sim$  is an equivalence relation on  $X$ . Is the quotient space  $X/\sim$  locally compact? Either prove that it is, or construct an example (with proof) in which it is not.

(P2) Show that  $\mathbb{R}_\ell$  is not metrizable. (Hint: You can use results developed in the examples in §30 of the textbook.)

(P3) Show that a countable product of separable spaces is separable.