

## MATE 5049 assignment 2

6. Problem 9, p. 44. Hint: in a finite-dimensional space, closed, bounded sets are compact. Further hint: show that, on  $R^n$ , the function  $\psi(a) = \|a_1x_1 + \dots + a_nx_n\|$  is a norm, and that  $a \rightarrow \|y - a_1x_1 - \dots - a_nx_n\|$  is continuous for this norm.
7. Problem 10, p. 44. Replace  $L_p$  by  $l_2$ .
8. Problem 12 p. 44.
9. In the plane, what is the orthogonal of: a) the segment joining (1,1) to (2,2)? b) the segment joining (1,0) to (2,1)?