MATE 6672 assignment 5

20. Exercise 7.6 p. 220.

21. Exercise 7.9 p. 220.

22. 7.13 pp. 222–223.

23. Let H be a prehilbert space, $w \in H$, and V a finite-dimensional subspace of H. We consider the problem of finding the minimum of $|w - v|^2$ over V.

    a) Show that u yielding the minimum in question (the existence of which we proved), is unique. You may use the necessary condition for optimality stated in (b).

    b) We showed in class that if $u \in V$ solves the problem, then $\langle w - u, v\rangle = 0$ for all $v \in V$. Show that this condition is also sufficient.

24. Exercise 9.7 p. 275.