

## 01325 Mathematics 4, Spring 2013

### Week no. 4

**Theory:** In the week February 25 – March 1 the lectures cover

Definition 2.5.1, Definition 2.5.4, Example 3.2.2, Sections 4.4–4.5

**Exercises for the week February 25 – March 1 :** 4.21 (check first that  $T$  is well defined), 4.18, 4.25 [only proof of formula (4.34)] , 1.16\*, 4.16, 4.19, 4.31

(I am confident that this program is enough, but if you want an extra challenge you can look at Exercise 4.15 )

**Hint to Exercise 4.25:** Let  $\mathbf{v} \in \mathcal{H}$ . Show first that if  $\phi_n$  is a sequence in  $\mathcal{H}$  that converges to  $\phi \in \mathcal{H}$ , then  $\langle \mathbf{v}, \phi_n \rangle \rightarrow \langle \mathbf{v}, \phi \rangle$  as  $n \rightarrow \infty$ . Now apply this result with  $\phi_n := \sum_{k=1}^n c_k \mathbf{v}_k$ .

[ When you have completed the exercise, you might notice that one of the assumptions was not used. Which one? ]

**Hint to Exercise 4.31:** Use the two results in Exercise 4.25.

**Homework 4, to be turned in no later than March 6:** 4.17, 4.22 (check first that  $S$  is well defined), 4.25 [only proof of formula (4.35)]

Regards,  
Ole