INSTRUCTIONS.
Work the following problems and hand in your solutions. Your solutions must be TYPED. You may work together with other people in the class, but you must each write and type your solutions independently. Please LIST all people that you collaborated with.
A subset of these problems will be selected for grading.

1. Exercise 3.104 on page 62 of the Chapter 3 lecture notes.

2. Exercise 3.110 on page 66 of the Chapter 3 lecture notes (you not required to do the challenge part in part (d), though of course I hope that you will do it anyway).
   Hint: Even though this problem comes before the discussion of inner products in Section 3.11.5, the easy way to prove that the $L^2$-norm satisfies the Triangle Inequality is to do part (a) of Exercise 3.125 first, because once you do that, Theorem 3.129 tells you that you automatically have a norm.

3. Exercise 3.125 on page 72 of the Chapter 3 lecture notes.

4. Problem 3.13 on page 80 of the Chapter 3 lecture notes (watch out for the numbering—please look on page 80! Problem 3.13 is at the bottom of the page, in Section 3.13).

5. Problem 3.16 on page 81 of the Chapter 3 lecture notes.
   Note: Be careful, these are infinite series of vectors, not infinite series of real numbers. You have to be careful to use the definition of convergence that is given in the problem statement. The Triangle Inequality is also helpful.