Second Homework: MATH 410  
Due Tuesday, 15 September 2009

1. Exercise 1 of Section 2.1 in the text.  
2. Exercise 2 of Section 2.1 in the text.  
3. Exercise 10 of Section 2.1 in the text.  
4. Exercise 1 of Section 2.2 in the text.  
5. Exercise 3 of Section 2.2 in the text.  
6. Exercise 5 of Section 2.2 in the text.  
7. Exercise 1 of Section 2.3 in the text.  
8. Exercise 2 of Section 2.3 in the text.  
9. Exercise 7 of Section 2.3 in the text.  
10. Show that \( \cos(k) > .5 \) frequently, but not eventually.  
11. Prove Proposition 2.5 in the notes.  
12. Let \( \{a_k\} \) be a monotonic sequence in \( \mathbb{R} \). Then \( \{a_k\} \) is convergent if and only if it has a convergent subsequence.