

**Second Homework: MATH 410**  
**Due Friday, 11 September 2020**

1. Prove assertion (a) of Proposition 2.17 in the notes.
2. Prove assertion (b) of Proposition 2.17 in the notes.
3. Prove assertion (a) of Proposition 2.18 in the notes.
4. Do the exercise at the bottom of page 11 in the notes.
5. Exercise 1 of Section 2.1 in the text.
6. Exercise 3 of Section 2.1 in the text.
7. Exercise 18 of Section 2.1 in the text.
8. Exercise 1 of Section 2.4 in the text.
9. Exercise 2 of Section 2.4 in the text.
10. Exercise 3 of Section 2.4 in the text.
11. Show that  $\cos(k) > .5$  frequently, but not eventually. Hint: Consider the size of the intervals in the sets

$$\{x \in \mathbb{R} : \cos(x) > .5\} \quad \text{and} \quad \{x \in \mathbb{R} : \cos(x) < .5\}.$$

12. Prove Proposition 2.7 in the notes.