Eighth Homework: MATH 410
Due Wednesday, 21 October 2020

1. Exercise 1 of Section 4.1 in the text.
2. Exercise 5 of Section 4.1 in the text.
3. Exercise 9 of Section 4.1 in the text.
4. Exercise 15 of Section 4.1 in the text.
5. Exercise 1 of Section 4.2 in the text.
6. Exercise 6 of Section 4.2 in the text.
7. Exercise 9 of Section 4.2 in the text.
8. Give a function $f : [-1, 1] \to \mathbb{R}$ that is differentiable over $[-1, 1]$ but whose derivative is not continuous over $[-1, 1]$.
9. Prove Proposition 6.3 in the notes.
10. Prove that if a function $f : (a, b) \to \mathbb{R}$ is differentiable and convex over (a, b) then $f' : (a, b) \to \mathbb{R}$ is nondecreasing over (a, b).
11. Show that the assertion of Proposition 6.9 on page 21 of the class notes is false if we replace (a, b) with either $(a, b]$, $[a, b)$, or $[a, b]$.
12. Prove assertions (6.24) and (6.25) of Proposition 6.10 in the class notes.