Kiril Datchev
MA 341
Fall 2021

Homework 8

Due Wednesday, November 17th at the beginning of class. Justify your answers. Please let me know if you have a question or find a mistake.

1. Exercise 19.3.2 from page 263. Use the Riemann sum theorem (Theorem 19.3) the fundamental theorem of calculus (Theorem 20.1), and the fact that $\frac{d}{dx}\ln(1+x^2) = 2x/(1+x^2)$.

2. Parts (a) and (b) of Exercise 19.4.2 from page 264.

   Hint: For part (a), show using the definition of continuity that, given such an f, there are an interval I contained in $[a,b]$ and a constant $d > 0$ such that the function h defined by

   $$h(x) = \begin{cases} d, & x \text{ in } I, \\ 0, & \text{otherwise}, \end{cases}$$

   obeys $h(x) \leq f(x)$ for all x in $[a,b]$.

3. Exercise 19.4.3 from page 264. Use the result of part (b) of Exercise 19.4.2 and an inequality for $\sin x$ from Chapter 15.

4. Exercise 20.2.1 from page 282.