Kiril Datchev
MA 504
Fall 2022

Homework 9

Due December 2nd on paper at the beginning of class. Please let me know if you have a question or find a mistake.

There are some hints on the second page.

1. Let $K\colon [0,1]\times[0,1]\to\mathbb{R}$ be continuous, let $g_1,\ g_2,\ \dots$ be a sequence of continuous functions $[0,1]\to[-1,1]$, and for each n and x let

$$f_n(x)=\int_0^1 K(x,y)g_n(y)dy.$$

   Prove that a subsequence of $f_1,\ f_2,$ converges uniformly on $[0,1]$.

2. Exercise 16 from page 168.

3. Exercise 18 from page 168. You may assume f is real valued.

4. Exercise 20 from page 169.

Hints:

1. Use Theorem 7.25. To check its hypotheses, use Theorems 4.15 and 4.19.
2. Examine the proof of Theorem 7.25.