

MATH 2050C Mathematical Analysis I
2022-23 Term 2
Problem Set 5

due on Feb 24, 2023 (Friday) at 11:59PM

Instructions: You are allowed to discuss with your classmates or seek help from the TAs but you are required to write/type up your own solutions. please do NOT come to campus to submit your completed assignments. Instead, you can either type up your assignment or scan a copy of your written assignment into ONE PDF file and submit through Gradescope on/before the due date. Please remember to write down your name and student ID. **No late homework will be accepted.** All the exercises below are taken from the textbook.

Required Readings: Chapter 3.2

Optional Readings: none

Problems to hand in

Section 3.2: Exercise # 1(a)(d), 5(b), 6(d), 7, 9, 18

Suggested Exercises

Section 3.2: Exercise # 1, 2, 3, 4, 5, 6, 10, 11, 12, 13, 14, 16, 17, 19, 23

Challenging Exercises (optional)

1. Section 3.2: Exercise # 8, 15, 20, 21, 22
2. Let (x_n) be a sequence of real numbers. Define a new sequence (s_n) by

$$s_n := \frac{x_1 + x_2 + \cdots + x_n}{n} \quad \text{for all } n \in \mathbb{N}.$$

- (a) Show that $\lim(s_n) = x$ provided that $\lim(x_n) = x$.
- (b) Find a divergent sequence (x_n) such that $\lim(s_n) = 0$.