Assignment 7 (10/10)

Subhadip Chowdhury

Problem 1

Problems $5.2.(15-18, 37d, 39)$

Problem 2

Evaluate

$$\lim_{n\to\infty} \frac{1}{n} \sum_{i=1}^{n} \sin\left(\frac{i\pi}{n}\right)$$

Problem 3

Suppose $f(x) = x^2$. For a positive real number a, find the value of

$$\lim_{n\to\infty} \sum_{i=0}^{n-1} \frac{a}{n} f\left(\frac{ai}{n}\right).$$

Also find the value of

$$\lim_{n\to\infty} \sum_{i=0}^{n-1} \frac{3}{n} f\left(\frac{2i+1}{n}\right).$$

Problem 4

Evaluate

$$\lim_{n\to\infty} \sum_{i=0}^{n-1} \frac{i^2+n^2}{n^2 i}$$

Problem 5

Evaluate

$$\lim_{n\to\infty} \sum_{i=0}^{n-1} \frac{i(i+1)}{n^3}$$