

ASSIGNMENT 4

Due Tuesday, October 5, 2004

Problem 1: The Cauchy Schwartz inequality states that for any real numbers a_1, a_2, \dots, a_n and b_1, b_2, \dots, b_n we have

$$\sum_{i=1}^n a_i b_i \leq \sqrt{\sum_{i=1}^n a_i^2} \sqrt{\sum_{i=1}^n b_i^2}.$$

Use the Cauchy Schwartz inequality to prove that for any two step functions, s and t defined on the interval $[a, b]$ we have

$$\int_a^b s(x)t(x)dx \leq \sqrt{\int_a^b s^2(x)dx} \sqrt{\int_a^b t^2(x)dx}.$$

Problem 2: Exercise 7 in page 70.

Problem 3: Exercise 9 page 70.

Problem 4: Exercise 11 pages 70-71.