General Mathematics and Computational Science I

Exercise 5

September 18, 2007

1. (From Ivanov, p. 8) Prove that any sum of more than 7 cents can be made up out of 3- and 5-cent coins.

   (Use the induction principle formulated in class!)

2. Using mathematical induction, prove that for all $n > 1$ the following inequality holds:

$$\frac{1}{2^2} + \frac{1}{3^2} + \ldots + \frac{1}{n^2} < 1 \tag{1}$$

   Hint: Prove that the sum on the left is less than or equal to $1 - \frac{1}{n}$. (A similar problem can be found in Ivanov, p. 9, Problem 7.)