

General Mathematics and Computational Science I

Exercise 12

November 9, 2006

1. Solve Problem 14 from Ivanov, p. 50.
2. For positive real numbers a_1, \dots, a_n , let

$$G(a_1, \dots, a_n) = \left(\prod_{i=1}^n a_i \right)^{\frac{1}{n}}$$

denote their geometric mean, and

$$A(a_1, \dots, a_n) = \frac{1}{n} \sum_{i=1}^n a_i$$

their algebraic mean. Show that, if $a_1 \neq a_2$, then

$$G(a_1, \dots, a_n) < G(a^*, a^*, a_3, \dots, a_n)$$

and

$$A(a_1, \dots, a_n) = A(a^*, a^*, a_3, \dots, a_n),$$

where

$$a^* = \frac{a_1 + a_2}{2}.$$

3. Solve Problem 17 from Ivanov, p. 53.