

Homework 2

Due: September 20, 2012, beginning of the lecture

PLEASE READ THE INSTRUCTIONS/SUGGESTIONS WRITTEN IN THE SYLLABUS!

Problems from the textbook:

- *I 3.12, Page 28:* 5, 7, 8, 9
- *I 4.4, Page 35:* 1 b), c), 2, 5, 7, 10

Additional problems:

1. Find all the square roots of $1 + i$.
2. Solve the following quadratic equation among the complex numbers:

$$x^2 - (4 - 2i)x + (2 - 3i) = 0$$

Hint: use the usual formula for the solution, simplify the answer (i.e. the $\sqrt{b^2 - 4ac}$ part) and check that the resulting complex number(s) solve the equation.

BONUS PROBLEM: We define a sequence of numbers the following way: $a_1 = 1$ and if we have a_n then $a_{n+1} = a_n + 1/a_n$. (E.g. $a_2 = 1 + 1 = 2$, $a_3 = 2 + 1/2 = 5/2$, $a_4 = 5/2 + 2/5$ etc.) Show that $a_{n+1} \geq \sqrt{2n}$.

DISCLAIMER: It is easy to find the solutions to (some of) these questions. (E.g. the internet, your fellow classmates ...) However, do NOT consult any of these solutions when working on this assignment or you will learn nothing from it and your chance of passing the course will be greatly diminished. If it becomes apparent to the grader that your solution is copied from existing solutions, you will be assigned a grade of zero for lack of originality.