Homework

due on Tuesday, May 3

Read carefully sections 10.1-10.4 and 12.1-12.2 in the book. Solve the following problems.

Problem 1. The sequence (a_n) is defined recursively as follows: $a_1 = 1$ and $a_{n+1} = \sqrt{2 + a_n}$ a) Assuming that the sequence (a_n) converges find its limit. Hint: You may use Problem 2b) from homework 26.

b) Prove that (a_n) converges. Hint: Perhaps the sequence is decreasing or increasing?

Problem 2. Let $f : (0, \infty) \longrightarrow \mathbb{R}$ be given by $f(x) = 2\lfloor x \rfloor - \lfloor 2x \rfloor$. What is the range of this function? Justify your answer.

Problem 3. Express the number $0.12121212\ldots$ as a fraction. Expalin all your computations.