Real Analysis - Homework 4

Note Title 9/8/2012

(1) Suppose $x_1 = 2$ and $x_{n+1} = \sqrt{x_n}$. Show that $\{x_n\}$ converges and find the limit.
Hint: use prop. 3.1.9

(2) Suppose $x_1 = 1$ and $x_{n+1} = 1 + \frac{1}{x_n}$ (a) Assuming the sequence converges, what is its limit?
(b) Compute a few members of the sequence and explain why it would be tricky or impossible to use prop. 3.1.9 directly to prove convergence. (c) Any suggestions for how to prove convergence (only ideas, you don't have to actually prove it) after all?

(3) Prove the second part of proposition 3.1.9: if $\{a_n\}$ is monotone decreasing and bounded below, then $\{a_n\}$ converges. Hint: see class notes or online text.