

Due Wednesday, April 22.

Be sure to write clearly, using complete sentences. Do not use abbreviations like s.t., w/, w/o, b/c, c/o, etc. In all problems you must prove that your answer is correct, even if the problem does not explicitly ask you to do so. In addition, one third of the grade on each exercise will be determined by the presentation of your argument. Even if your answer is in the end correct, you will lose points if there are irrelevant, extraneous or incorrect statements in your argument. There will be no revision for this homework. Since there is restriction on how much you can write in each problem, you should consider carefully what is essential to include, before writing your final answers.

1. Problem 3 Page 287. Do each part in no more than 10 lines.
2. Problem 8 Page 288. Do each part in no more than 10 lines.
3. Problem 9 Page 288. Do each part in no more than 10 lines.
4. Problem 13 Page 288. Do this in no more than 30 lines. You are given that $a_n \rightarrow L$. Name a subsequence $b_k = a_{n_k}$. You want to prove that $b_k \rightarrow L$. Useful is the fact that $k \leq n_k$ for all k .
5. Problem 18 Page 288. Do this in no more than 20 lines. Use induction.
6. Problem 19 Page 289. Do this in no more than 1 page. Use induction to prove that $x_n > \sqrt{3}$ for all $n \geq 2$. Then prove that $x_{n+1} - x_n < 0$. Thus $\langle x_n \rangle_{n \geq 2}$ is decreasing and bounded below, hence has a limit, say α . Show that $2\alpha = \alpha + 3/\alpha$. Use this to show that $\alpha = \sqrt{3}$.