

Math 453, Section X, Spring 2008
HW Assignment 9, due Monday, 4/28/2008

Name (print please):

Comments and Hints

Most of the problems in this set are computational problems, and for the majority of these the answer is given in the back of the book.

Continued fraction expansions of irrationals: Such expansions fall into two categories: (i) those of *quadratic* irrationals (such as $\sqrt{7}$), and (ii) those of other irrationals (e.g., π , or $\sqrt[3]{2}$).

In the second case, the expansion (usually) has no discernable pattern and it is impossible to obtain a *complete* continued fraction expansion of the number. The best one can usually do is to numerically compute the first few terms of the expansion.

For the first case (i.e., continued fractions of quadratic irrationals), you could numerically compute the first few terms until a periodic pattern appears to emerge, and then *guess* the remainder of the expansion. This is done in Examples 10 or 11 of the book. However, the book also points out that these examples do not provide a *proof* that the expansion indeed is of this form, and it refers to Problems 27 and 28 in 7.4 for a proof. To obtain such a proof requires a different algorithmic approach; examples will be given in class.

HW 9 Problems (from Sections 7.2 - 7.5 of Strayer)

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| 1. * 7.2:9(a) | 8. * 7.4:21(a) (You can use a calculator) |
| 2. * 7.2:9(e) | 9. * 7.4:27 |
| 3. * 7.2:11(a) | 10. * 7.4:28 |
| 4. * 7.2:11(c) | 11. * 7.5:33(c) |
| 5. * 7.3:17(a) | 12. * 7.5:38(a) |
| 6. * 7.3:17(e) | 13. * 7.5:40: Ignore this problem, since it depends on a result from Section 7.6! |
| 7. * 7.3:18 (Hint: Induction) | |