Problem Set 3 Due Apr. 8. 2008

1. Section 18 (page 175). Problems 14-19. In addition:
   Let $UT_2(\mathbb{Q}) = \left\{ \begin{bmatrix} a & b \\ 0 & c \end{bmatrix} \mid a, b, c \in \mathbb{Q} \right\}$ and
   Let $UT_2(\mathbb{Z}) = \left\{ \begin{bmatrix} a & b \\ 0 & c \end{bmatrix} \mid a, b, c \in \mathbb{Z} \right\}$. Convince yourself that $UT_2(\mathbb{Q})$ and $UT_2(\mathbb{Z})$ are rings and then find the units in both.
2. (page 175) Problems 23-26.
3. (page 176) Problem 38.
4. (page 177) Problem 52. This is a special case of a more general result.
5. Harder. Extra credit. In the ring, $\{a + b\sqrt{7} \mid a, b \in \mathbb{Z}\}$, 1 is unity, and ± 1 are obvious units. Can you find other units? Can you find all the units?
6. Section 19 (page 182). Problems 5-10.
7. Section 20 (page 189) Problem 4 or 5.
8. Section 20 (page 189) Problem 9.
9. Section 20 (page 189) Any two of 11-18.
10. Section 20 (page 190) Problems 27 and 28, including both halves of 28.
11. Section 20 (page 189) Problems 19.
12. Section 20 (page 189) One of 20-22.