HW #6, DUE 5-12

1. Show that a valuation ring A is Noetherian if and only if it is a DVR.

2. Show that an ideal P in a valuation ring A is prime if and only if the set $v(S)$ of v-values attached to the elements of the complement S of P in A is a lower ideal of the value group G such that $v(S) \cup -v(S)$ is also a subgroup of G (written additively). Give an example of a totally ordered abelian group G admitting such a subgroup different from 0 or G.

3. Exercise 6.11 in Eisenbud (pp. 175-6 of the 2004 edition), parts (a),(b),(d).

4. Exercise 10.2 in Eisenbud (p. 244 of 2004 edition); you may omit the inifinitude of the primes of type (b).

5. Exercise 10.4 in Eisenbud, p. 245.