Homework 8 – due 10/24/07

Math 600

36. Dummit-Foote, 8.2, #6.

37. Dummit-Foote, 8.2, #8.

38. Dummit-Foote, 8.3, #5.

39. Dummit-Foote, 9.2, #4.

40. Let R be a domain, $a \in R\backslash\{0\}$, and let I be the ideal in $R[X]$ generated by a and X. Show that I is principal only if $a \in R^\times$.

41. Let $\omega \in \mathbb{C}$ be a solution of $X^3 = 1$ with $\omega \neq 1$. Let $R = \{a + b\omega \mid a, b \in \mathbb{Z}\}$. Clearly R is a domain. Show R is a PID.