

March 10, 2008

18.702 Problem Set 5

due monday, March 17, 2008

1. Let R denote the polynomial ring $\mathbb{C}[t]$ in one variable. Adapt the proof of the Gauss Lemma and of unique factorization in $\mathbb{Z}[x]$ to prove analogues of (3.3)-(3.9) of Chapter 11 for the ring $R[x]$, which is isomorphic to the polynomial ring $\mathbb{C}[t, x]$ in two variables.
2. Chapter 10, Exercise 8.4
3. Chapter 10, Exercise 8.11
4. Chapter 10, Misc. Exercise 5.
5. Chapter 10, Misc. Exercise 20.
6. Chapter 10, Misc. Exercise 24(a,b,c)
7. Determine the number of points of intersection of the two loci $y^2 = x^3 - 1$ and $x^2 + xy = 1$.