Course: Commutative Algebra

Last Homework 14 (due to next Friday, 6/8/2012)

R is a commutative ring with identity.

1. Let $R = k[x, y, z]/(x^2 + y^2, xy, x^2 + y^3)$, where k is a field. Calculate the module differentials $\Omega_{R/k}$.

2. Suppose that R is a Noetherian integral domain that is not a field. Prove that R is Dedekind Domain if and only if nonzero primes M are maximal and every M-primary ideals is a power of M.

3. Suppose I and J are nonzero ideals in the Dedekind Domain R. Prove that there is an ideal $I_1 \simeq I$ that is relatively prime to J.

4. If R is a nonzero prime ideal in the Dedekind Domain R prove that R/P^n is not a projective R-module for any $n \geq 1$.