

Commutative Algebra & Algebraic Geometry
SS 2010

- (23) Consider the projective hyperbola \mathcal{H}_p defined by $y^2 - x^2 - z^2 = 0$ (as in Example 5.1.2(b)) in $\mathbb{P}^2(\mathbb{C})$. \mathcal{H}_p contains the point $P = (1 : -1 : 0)$. What is the equation of the corresponding curve in U_1 (removing the hyperplane at ∞ w.r.t. x) and what are the corresponding affine coordinates of P ? Plot the affine curve together with the asymptote through P .
- (24) Consider the circle \mathcal{C}_a of radius a defined by $x^2 + y^2 - a^2 = 0$ in $\mathbb{A}^2(\mathbb{C})$. What are the points at ∞ of the corresponding projective circle?
- (25) Prove Lemma 5.2.3.
- (26) Prove Lemma 5.2.5.