

Algebraic Geometry: additional exercises (due Nov 2)

1. A conic in the projective plane \mathbb{P}^2 is given by a homogeneous quadric polynomial in $k[x, y, z]$.
 - (a) Show that any two irreducible conics in \mathbb{P}^2 are the same up to a linear change of coordinates.
 - (b) Show that in \mathbb{A}^2 there exactly two (classes of) nonisomorphic (nondegenerate) conics:

$$\mathbb{V}(y - x^2) \text{ and } \mathbb{V}(xy - 1).$$