

ALGEBRAIC GEOMETRY

HOMEWORK 5

- (1) Find the line going through the points $[1 : 0 : -1]$ and $[2 : 1 : 0]$.
- (2) Find the point of intersection of the lines $X + Y = 0$ and $X + 2Y - Z = 0$.
- (3) Find all points at infinity on $x^4 + y^4 = 1$ in $\mathbb{A}^2\mathbb{C}$, and compute the tangents there. Is any of the tangents real? Draw a sketch of the curve.
- (4) Find all singular points on the curve $x^4 + y^4 - x^2y = 0$, and show that the curve can be parametrized. (Hint: lines through the unique singular point).
- (5) Show that the cubic surface $x^2 + y^3 - y^2 + z^2 = 0$ has a singular point. Parametrize the surface by using sweeping lines through the origin.