Prof. Norbert Peyerimhoff, Durham University 5/3/2014

Algebraic Geometry III/IV

Problems, set 7.

Exercise 10. Resolve the singularities of the following affine algebraic curves by subsequent blow-ups in the singular points. Calculate also at each step of the blow-up process the tangent lines at the blow-up centre and the preimages of the blow-up centre under the involved strict transforms, and decide which of these preimages are still singular and need to be blown up again:

(a) The curve $C_f \subset \mathbb{C}^2$, given by $f(x,y) = x^2 - x^4 - y^4$.

(b) The curve $C_g \subset \mathbb{C}^2$, given by $g(x,y) = y^3 - x^5$.