Universität Konstanz
Fachbereich Mathematik und Statistik
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CLASSICAL ALGEBRAIC GEOMETRY

12th problem sheet
Tutorial on 7 July 2015

1. Let $C_1 \subset \mathbb{R}^2$ be a smooth real affine curve and suppose that $M \subset C_1(\mathbb{R})$ is an oval, i.e. a compact connected component of $C_1(\mathbb{R})$. Show that if $C_2 \subset \mathbb{R}^2$ is any other curve, then $M \cap C_2(\mathbb{R})$ consists of an even number of points, counted with multiplicities.

2. Complete the topological classification of smooth quartics in the real projective plane given in the lecture and extend it to the case of quintics. Use software to find examples for each possible arrangement of the connected components.