

# Algebraic Methods in Kinematics

## Homework 6

### corrected version from 24.5.

Compute the number of embeddings up to translations and rotation for the Laman graph with 7 vertices and edges

$$E = \{(1, 3), (3, 2), (1, 4), (4, 2), (1, 5), (1, 6), (6, 2), (3, 7), (4, 7), (5, 7), (6, 7)\}$$

and random labels  $\lambda_{ij} \in \{1, \dots, 1000\}$ , using a computer algebra program (Maple, Mathematica, or Sage).

Hint: if you use Mathematica, then you will find no program for computing the number of complex solutions of a system of polynomial equations. However, this number can be obtained by inspecting the output of a Gröbner bases. Here is an example: `math> GroebnerBasis {x y-1,x+y,x,y }` returns  $1 + y^2, x$ . For maximal ideals (as in this case, for generic parameters), the product of the degree of the leading variables (the variable which comes latest in the input list) is the number of solutions.