

- Section 2.1. (Solving and M2 exploration) Solve the system

$$\begin{cases} x^2 + y^2 + z^2 - 2x = 0; \\ xy - y = 0; \\ xz - z = 0; \\ yz^3 - yz = 0. \end{cases}$$

using M2. (Hints: `Lex`, `selectInSubring`, `factor`, `sub`, `mingens`.)

Visualize the equations in  $\mathbb{R}^3$ : draw a picture of the hypersurface defined by the first and the variety defined by the rest of the equations in order to see the intersection of the two.

- Section 2.2. Exercise 10.
  - Section 2.4. Exercises 12,13
  - (Gröbner Fan) Determine the Gröbner basis of the ideal of the affine twisted cubic curve:  $I = \langle y - x^2, z - x^3 \rangle$ . Explain why all of the cones have a common 1-dimensional edge in this example.
  - Section 3.1. Exercises 6,12
  - Section 3.2. Exercise 8.
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