Introduction to Languages for Scientific Computing

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High Performance and Automatic Computing





Write the function polyPlot[yourLastName][p_]

Input

A polynomial p of unknown degree n>2

Output

A 2d plot of p in the region of interest, suitably annotated

Goals

- i. Identify & highlight interesting features of *p*; these features determine the region of interest
- ii. Add suitable annotations/labels
- iii. Use Manipulate to slide an object along the polynomial

Features of interest:

zeros (p(x) = 0), maxes & mins (p'(x) = 0), saddles (p''(x) = 0), intersections with y = x (p(x) = x); possibly also $p'(x) = \pm 1$.

Example



Note: the annotations are missing

Plotting polynomials – 3D

- Write the function polyPlot3D[yourLastName][p_]
- The input is a polynomial in 2 variables.
 Example: p[x_,y_] := x^2 + x^2 y 2 y^3 + 4
- The output is a 3D plot (Plot3D, Graphics3D) of the polynomial, in a region of interest.
- Define the region of interest according to your own criteria. Be creative. Make it interesting.
- Annotate, highlight, augment, display the polynomial as you see fit.

Submission

- Individual assignment.
- Prepare a Mathematica notebook named <yourLastName>.nb. Include the definitions for polyPlot and polyPlot3D. Make sure such definitions are clearly separated.
- Add any other definition needed.
- Include your name at the top of the notebook.
- Submission by email to pauldj@aices.rwth-aachen.de
- Email's subject: "LSC-15 Challenge5 <your last name>"
- Deadline: Wednesday, January 13, 1pm.