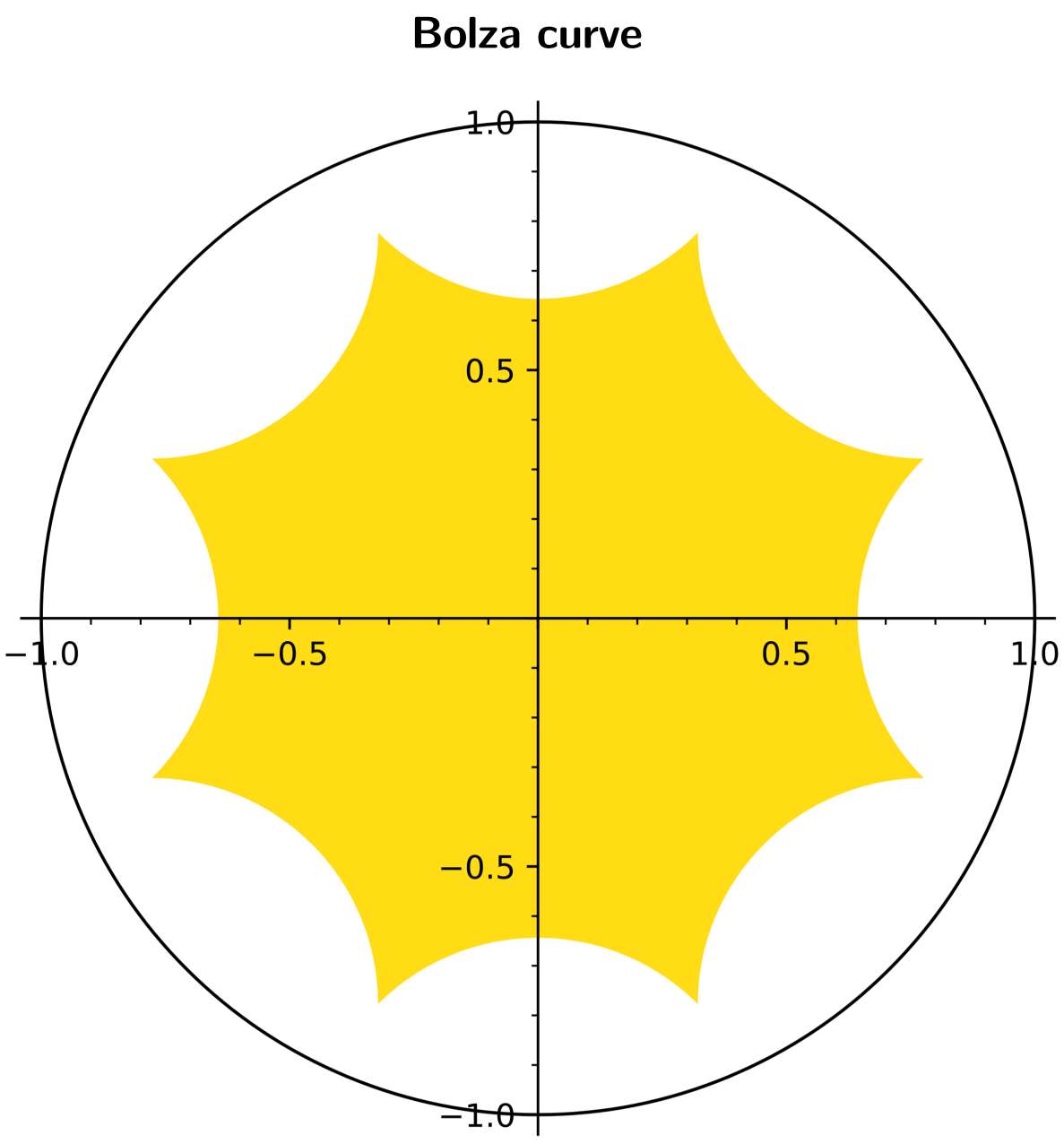
Info

This note, that was found here, as a part of a collection
is written (completely with human hands) by Rupadarshi Ray,
was created on March 4, 2026 2:39:56 PM,
was last modified on September 2, 2026 9:55:11 PM, and
was exported on September 7, 2026 2:50:34 PM.




```
r = 2**(-0.25)
points = [
    (r*cos(pi/8+2*pi*k/8), r*sin(pi/8+2*pi*k/8))
    for k in range(8)
]

hyperbolic_polygon(points, model='PD', fill=True, color='yellow')
```

```
g = hyperbolic_regular_polygon(6, pi/4, center=3+15*I, fill=True,
color='green')
g.plot()
```

as a normalization of a degree 5 planar curve

The smooth affine curve

$$Z(Y^2 - X^5 + X)(\mathbb{C})$$

has projective completion

$$V(Y^2 - X^5 + X)(\mathbb{C})$$

which is singular at infinity.

Consider the normalization

$$N(V(Y^2 - X^5 + X))$$

[1]

as a hyperelliptic Riemann surface of genus 2

Consider

$$S(Y^2 - X^5 + X; Y) = S(\sqrt{X^5 - X})$$

[2]

as a curve in $\mathbb{C}P^3$

as an arithmetic hyperbolic surface

Aut

As a curve

As a side-paired polygon

Spectrum

function field

Jacobian

$$\mathrm{Jac}(\mathrm{Bolza}) \cong \frac{\mathbb{C}}{\mathbb{Z}[\sqrt{-2}]} \times \frac{\mathbb{C}}{\mathbb{Z}[\sqrt{-2}]}$$

Current note has 1 direct children and 1 total descendants.

- squishy
  - Polynomials
    - Bolza curve
      - Hyperelliptic integrals and holomorphic forms on $S(Y^2 - X^5 + X)$
- stem
  - Objects stemming from $PSL(2)(\mathbb{R})$
    - Fuchsian groups $\Gamma <_{\mathsf{d}} PSL(2)(\mathbb{R})$ $\leftrightarrow$ oriented hyperbolic 2-manifold/orbifolds $\rightarrow$ Riemann surfaces with branching signature

And it has 17 siblings.

- squishy
  - Polynomials
    - $X^n + Y^n = Z^n$
    - $8X^3 + 4X^2 - 4X - 1$
    - $x^2 + y^2 - 3$
    - Folium of Descartes

      $$X^3 + Y^3 - 3aXY$$

    - $X^3 + Y^3 - a$
    - $3X^3 + 10X^2 + 3 - Y^2$
    - $3X^8 + 10X^4 + 3 - Y^2$
    - $XYZ - 1$
    - Pythagorean triples
    - Bolza curve
    - Irreducible polynomials in $\mathbb{C}[x, y]$
    - Polynomial maps $\mathbb{C}^n \to \mathbb{C}^n$ of degree at most d
    - Chebyshev polynomials of the first kind
    - Logistic map
    - Dynamics of the map $z^2 + c$
    - $\begin{pmatrix} x \\ y \\ y \end{pmatrix} \mapsto \begin{pmatrix} (1+xy)^3 z + y^2(1+xy)(4+3xy) \\ y + 3x(1+xy)^2 z + 3xy^2(4+3xy) \\ 2x - 3x^2 y - x^3 z \end{pmatrix}$
    - $(w^2 - 1)^2$

---

1. https://math.stackexchange.com/a/4623873 ↩
2. https://www.tandfonline.com/doi/full/10.1080/10586458.2015.1073642#abstract ↩