

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 September 2, 2026 11:43:09 AM, was last modified on September 2, 2026 3:42:57 PM, and was exported on September 7, 2026 2:50:35 PM.

$$\begin{pmatrix} x \\ y \\ y \end{pmatrix} \mapsto \begin{pmatrix} (1 + xy)^3 z + y^2(1 + xy)(4 + 3xy) \\ y + 3x(1 + xy)^2 z + 3xy^2(4 + 3xy) \\ 2x - 3x^2 y - x^3 z \end{pmatrix}$$

The polynomial map has a constant Jacobian determinant -2 .

```
from sage.all import *

var('x y z')

F1 = (1 + x*y)**3 * z + y**2 * (1 + x*y) * (4 + 3*x*y)
F2 = y + 3*x*(1 + x*y)**2 * z + 3*x*y**2*(4 + 3*x*y)
F3 = 2*x - 3*x**2*y - x**3*z

J = matrix([
    [diff(F1,x), diff(F1,y), diff(F1,z)],
    [diff(F2,x), diff(F2,y), diff(F2,z)],
    [diff(F3,x), diff(F3,y), diff(F3,z)]
])

print(factor(J.det()))
```

-2

However,

$$\begin{pmatrix} 0 \\ 0 \\ \frac{1}{4} \end{pmatrix}, \begin{pmatrix} 1 \\ -\frac{3}{2} \\ \frac{13}{2} \end{pmatrix}, \begin{pmatrix} -1 \\ \frac{3}{2} \\ \frac{13}{2} \end{pmatrix} \mapsto \begin{pmatrix} -\frac{1}{4} \\ 0 \\ 0 \end{pmatrix}$$

Current note has 0 direct children and 0 total descendants.

- [squishy](#)
 - [Polynomials](#)
 - $\begin{pmatrix} x \\ y \\ y \end{pmatrix} \mapsto \begin{pmatrix} (1 + xy)^3 z + y^2(1 + xy)(4 + 3xy) \\ y + 3x(1 + xy)^2 z + 3xy^2(4 + 3xy) \\ 2x - 3x^2 y - x^3 z \end{pmatrix}$

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 \rightarrow \mathbb{C}^n\$ of degree at most \$d\$](#)
 - [Chebyshev polynomials of the first kind](#)
 - [Logistic map](#)
 - [Dynamics of the map \$z^2 + c\$](#)
 - $\begin{pmatrix} x \\ y \\ y \end{pmatrix} \mapsto \begin{pmatrix} (1 + xy)^3 z + y^2(1 + xy)(4 + 3xy) \\ y + 3x(1 + xy)^2 z + 3xy^2(4 + 3xy) \\ 2x - 3x^2 y - x^3 z \end{pmatrix}$
 - $(w^2 - 1)^2$