

Unsolved problems

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Contents

1 Galois Theory	2
2 Algebraic Geometry	2
3 Algebraic Topology	2

1 Galois Theory

2 Algebraic Number Theory

3 Algebraic Geometry

Question 3.1: Jacobian conjecture for \mathbb{A}^2 and \mathbb{A}^n

Let k be a field with $\text{char}k = 0$. Given $f, g \in k[x, y]$, $x' = f(x, y)$ $y' = g(x, y)$ is an automorphism in \mathbb{A}^2 \Leftrightarrow the Jacobian determinant $\frac{\partial(f,g)}{\partial(x,y)}$ is a non-zero constant.
A general version is for \mathbb{A}^n .

Updates: This conjecture is proved for $\deg f$ and $\deg g$ are not too large (≈ 100).

4 Algebraic Topology