



SJÄLVSTÄNDIGA ARBETEN I MATEMATIK

MATEMATISKA INSTITUTIONEN, STOCKHOLMS UNIVERSITET

Gröbner Bases and Elimination in Macaulay 2

av

Christian Eriksson

2026 - No 5

Gröbner Bases and Elimination in Macaulay 2

Christian Eriksson

Självständigt arbete i matematik 15 högskolepoäng, grundnivå

Handledare: Sofia Tirabassi

2026

Abstract

Your summary goes here

Contents

1	Introduction	8
2	What is Algebraic Geometry?	9
2.1	Polynomials	9
2.2	Affine Varieties	9
2.3	Rings and Ideals	9
2.4	Ordering Polynomials	9
2.5	An Analytic Bridge	9
2.6	Hilbert Strong Nullstellensatz	9
3	Gröbner Bases	10
3.1	Hilbert Bases	10
3.2	Gröbner Bases	10
3.3	Properties of Gröbner Bases	10
	References	11

1 Introduction

Hello world [LM21]

2 What is Algebraic Geometry?

2.1 Polynomials

2.2 Affine Varieties

2.3 Rings and Ideals

2.4 Ordering Polynomials

2.5 An Analytic Bridge

2.6 Hilbert Strong Nullstellensatz

3 Gröbner Bases

3.1 Hilbert Bases

3.2 Gröbner Bases

3.3 Properties of Gröbner Bases

References

- [LM21] Antonio Tornambè Laura Menini, Corrado Possieri. *Algebraic Geometry for Robotics and Control Theory*. WORLD SCIENTIFIC (EUROPE), 2021.
URL: <https://www.worldscientific.com/doi/abs/10.1142/q0308>,
[arXiv:https://www.worldscientific.com/doi/pdf/10.1142/q0308](https://www.worldscientific.com/doi/pdf/10.1142/q0308),
[doi:10.1142/q0308](https://doi.org/10.1142/q0308).