

# Chapter 1

## Statistics

### 1 Introduction

The following are references.

- E Artin, Galois theory, 1994
- A Grothendieck and M Raynaud, Revêtements étales et groupe fondamental, 2002
- I N Herstein, Topics in algebra, 1975
- M Reid, Galois theory, 2014

**Notation.** If  $K$  is a field, or a ring, I denote the **ring of polynomials** with coefficients in  $K$ .

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## **2 Central tendency and dispersion**

- 2.1 Mean, variance and moments**
- 2.2 Parameter estimation**
- 2.3 Other measures of central tendency**
- 2.4 Sampling from normal RVs**

## **3 Hypothesis testing**

- 3.1 Introduction**
- 3.2 Single sample hypothesis testing**
- 3.3 Distribution of p-values**
- 3.4 Errors**
- 3.5 Two sample hypothesis testing**
- 3.6 Multiple hypothesis testing**

## **4 Covariance and Correlations**

- 4.1 Covariance**
- 4.2 Correlation**

## **5 Statistical models**

- 5.1 Definitions**
- 5.2 Likelihood**
- 5.3 Linear regression**

## **6 Bayesian inference**

- 6.1 Definitions**
- 6.2 Conjugate pair distributions**
- 6.3 Intractable posteriors**
- 6.4 Choosing a prior**

## **7 Bootstrap**

- 7.1 Empirical distribution**
- 7.2 Bootstrap procedure**