

STUDY GUIDE TO THE SECOND MIDTERM

The second midterm covers all of the material up to now. This guide will describe what you need to know in **addition** to the study guide for the first midterm. This guide covers 3.1, 3.2, 3.3, 4.1, 4.2, 4.3, 4.4, 4.5 and 4.6. No calculators, closed book, no notes and no need for a blue book.

Definitions:

Knowing and understanding definitions means being able to write the mathematical statement of the definition and being able to explain the definition in your own words. Here are the words and definitions you should know and understand for the second midterm:

- the vector space of polynomials of degree at most n ;
- a linear subspace of a vector space;
- basis (of a vector space);
- dimension (of a vector space);
- null space, column space, row space (of a matrix);
- rank and nullity (of a matrix);
- determinant (of a matrix).

Notation:

Here is some useful notation that might appear in a question and which you also might be able to use to answer a question:

- standard basis of \mathbb{R}^n ;
- change of coordinates matrix;
- cofactor expansion (in the context of computing a determinant).

Theorems:

Here are theorems whose content you should understand well. You will not be asked to write these theorems verbatim on the exam, so you don't need to memorise the exact statements, but knowing these results will help you solve some of the exam questions:

- Theorem 3, on page 169;
- Theorem 4, on page 171;
- Theorem 5, on page 172;
- Theorem 6, on page 173;
- Theorem 9, on page 180;
- Theorem 7, on page 216;
- Theorem 12, on page 227;
- Theorem 14, on page 233.