Revision: Chapter 1: Vector spaces

You should be able to do the following:

- Explain in your own words what a vector space over $\mathbb{F}$ ($= \mathbb{R}$ or $\mathbb{C}$) is. (You do not need to remember the axioms $(V1)$–$(V8)$).
- Give examples of vector spaces.
- Define what a subspace of a vector space is.
- Determine whether certain subsets of vector spaces are subspaces or not (as in Exercise Sheet 1, questions 3,4,5,and 6).
- Define what a linear combination of vectors is.
- Define what the subspace spanned by a set of vectors is, and what a spanning set for a vector space is.
- Define what a linearly independent set of vectors is.
- Define what a basis for a vector space is.
- Give examples of bases for $\mathbb{R}^n$, P_n and $M(2,2)$.
- Determine whether certain sets of vectors are spanning sets, linearly independent sets, bases or neither (as in Exercise Sheet 2, questions 1,2,3,4 and 5).
- Define what the dimension of a vector space is.