

Revision: Chapter 2: Linear maps

You should be able to do the following:

- Define what a linear map is.
- Determine whether certain maps are linear (as in Exercise Sheet 3, question 1).
- Determine whether certain linear maps exist or not (as in Exercise Sheet 3, question 2).
- Define what it means for a map to be injective or surjective.
- Determine whether certain linear maps are injective or surjective (as in Exercise Sheet 3, question 3).
- Define the kernel, the image, the rank and the nullity of a linear map and state the Rank-Nullity theorem.
- Determine the kernel and the image of certain linear maps and find bases for each of them (as in Exercise Sheet 3, question 4).
- Explain how to associate a matrix to a given linear map between vector spaces with respect to some fixed bases.
- State the product rule for the matrix representing the composition of two linear maps with respect to some fixed bases.
- State the change of bases theorem for matrices representing the same linear map with respect to different bases.
- Write down vectors in coordinate form with respect to some fixed basis (as in Exercise Sheet 4, question 1)
- Find the matrix representing certain linear maps with respect to some fixed bases (as in Exercise Sheet 4, questions 2,3,4)