

Math 311, Homework 8

due March 19

- Section 3.5C (p. 142), problems 1, 3, 4, 11.
- Section 3.6A (p. 148), problems 3, 5, 6, 8, 15, 17.

Extra problems

1. Let $L : \mathcal{P}_2 \rightarrow \mathcal{P}_2$ be the linear transformation defined by

$$L[p] = (x^2 + 2)p'' + (x - 1)p' - 4p.$$

Find the matrix for L . Find bases of polynomials for the image and null space of L .

2. Let A be the matrix

$$\begin{pmatrix} 1 & -2 & 3 & 3 \\ 2 & -5 & 7 & 3 \\ -1 & 3 & -4 & 3 \end{pmatrix}.$$

Find the dimension of the image of A . Use it and problem 3.5C.11 to find the dimension of the null space of A .

3. Suppose that B is a 7×10 matrix, and that the dimension of the null space of B is 5. What is the dimension of the image (column space) of B ?