

MATHEMATICS 2270. Homework # 11.

1. §7.4, # 10.
2. §7.4, # 20.
3. §7.4, # 32.
4. §7.4, # 50. Do not forget to find all eigenvalues and bases of eigenvectors for the corresponding eigenspaces in this problem!
5. Consider the matrix

$$A = \begin{bmatrix} 0 & 0 & 0 & 1 \\ 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 1 & 0 \end{bmatrix}.$$

Find all complex eigenvalues of A and construct a complex eigenbasis. Use diagonalization to compute the powers A^n for all natural numbers n . Hint: represent n as $n = 4k + p$ where $0 \leq p < 4$. Check that the power A^n depends on the number p and not on k .

6. §7.5, # 22.