

## MATH 121

### HOMEWORK 11, DUE NOVEMBER 19

#### Part I

- (1) Axler, page 190, Problem 25.
- (2) Axler, page 190, Problem 26.
- (3) Axler, page 190, Problem 27.
- (4) Axler, page 190, Problem 28.

#### Part II

- (5) Axler, page 191, Problem 29.
- (6) Axler, page 191, Problem 30.
- (7) Axler, page 191, Problem 31.
- (8) Is the following matrix nilpotent?

$$\begin{pmatrix} 2 & 1 & 0 & 0 \\ 0 & 2 & 1 & 0 \\ 0 & 0 & 2 & 1 \\ 0 & 0 & 0 & 2 \end{pmatrix}$$

- (9) Let  $V$  be a vector space over  $\mathbb{C}$  and let  $T \in \mathcal{L}(V)$ . In class we gave a geometric description of the characteristic polynomial of  $T$  in terms of eigenvalues and generalized eigenspaces. Describe the minimal polynomial of  $T$  in a similar way.