

## Math 341: Supplemental Homework

1. For the matrix given below:

$$\begin{bmatrix} 1 & 1 & 0 \\ 5 & 2 & 1 \\ 0 & 1 & 1 \end{bmatrix}$$

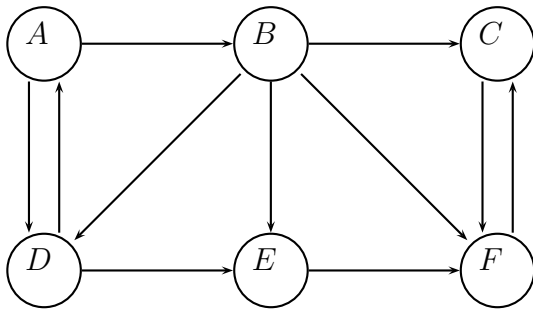
- (a) Find the characteristic polynomial.
- (b) Find the eigenvalues.
- (c) Find the corresponding eigenspaces.

2. For the matrix given below:

$$\begin{bmatrix} 0 & 2 & 0 \\ -1 & 4 & 1 \\ -3 & -2 & -3 \end{bmatrix}$$

- (a) Find the characteristic polynomial.
- (b) Find the eigenvalues.
- (c) Find the corresponding eigenspaces.

3. Say you have a network with six websites  $A, B, C, D, E, F$  which link to each other as follows:



- (a) Construct the ranking matrix for the system.
- (b) Find the weight vector and rank the websites accordingly.
- (c) How does the system change if  $C$  adds a link to  $B$ ?