

Math 205
Quiz #8

1. Find the eigenvalues and eigenspaces for the following matrix

$$A = \begin{bmatrix} 1 & 1 \\ 0 & 2 \end{bmatrix}.$$

$$\lambda_1 = 1$$
$$\lambda_2 = 2$$

$$\underline{\lambda_1 = 1}:$$

$$A - \lambda I = \begin{bmatrix} 0 & 1 \\ 0 & 1 \end{bmatrix}$$

$$\Rightarrow y = 0 \quad x \text{ arbitrary}$$

$$E_{\lambda_1} = \text{span} \left\{ \begin{bmatrix} 1 \\ 0 \end{bmatrix} \right\}$$

$$\underline{\lambda_2 = 2}$$

$$A - \lambda I = \begin{bmatrix} -1 & 1 \\ 0 & 0 \end{bmatrix}$$

$$\Rightarrow x = y$$

$$E_{\lambda_2} = \text{span} \left\{ \begin{bmatrix} 1 \\ 1 \end{bmatrix} \right\}$$