

Quiz 8 MATH 3504 Spring 2019

$$A = \begin{pmatrix} -2 & -3 \\ 3 & -2 \end{pmatrix}$$

$$\lambda = -2 - 3i$$

↓ find e-vector

$$(A - \lambda I) \vec{v} = \vec{0}$$

$$\left(\begin{pmatrix} -2 & -3 \\ 3 & -2 \end{pmatrix} - \begin{pmatrix} -2-3i & 0 \\ 0 & -2-3i \end{pmatrix} \right) \begin{pmatrix} v_1 \\ v_2 \end{pmatrix} = \begin{pmatrix} 0 \\ 0 \end{pmatrix}$$

$$\begin{pmatrix} 3i & -3 \\ 3 & 3i \end{pmatrix} \begin{pmatrix} v_1 \\ v_2 \end{pmatrix} = \begin{pmatrix} 0 \\ 0 \end{pmatrix}$$

$$\Rightarrow 3iv_1 - 3v_2 = 0$$

$$\Rightarrow v_2 = iv_1$$

$$\Rightarrow \text{eigenvector is } \vec{v} = \begin{pmatrix} v_1 \\ v_2 \end{pmatrix} = \begin{pmatrix} v_1 \\ iv_1 \end{pmatrix} = \begin{pmatrix} 1 \\ i \end{pmatrix} v_1$$