

Quiz 3

Summer 2011

Math 1180

Your name: _____

1. [5 points] Find all eigenpairs of the matrix

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

2. [5 points] Prove that T is a linear transformation if

$$T \begin{bmatrix} x \\ y \end{bmatrix} = \begin{bmatrix} -y \\ x + 2y \\ 3x - 4y \end{bmatrix}.$$

3. [5 points] Find $A^{15} \bar{\mathbf{x}}$ if $\bar{\mathbf{x}} = \begin{bmatrix} -3 \\ 8 \end{bmatrix}$

and the matrix A has eigenpairs $\lambda_1 = -1$, $\bar{\mathbf{v}}_1 = \begin{bmatrix} 1 \\ 2 \end{bmatrix}$ and $\lambda_2 = 1$, $\bar{\mathbf{v}}_2 = \begin{bmatrix} 3 \\ -1 \end{bmatrix}$.

bonus problem [5 points extra] Find $\begin{vmatrix} 3a & -b & 2c \\ 3d & -e & 2f \\ 3g & -h & 2i \end{vmatrix}$ if $\begin{vmatrix} a & b & c \\ d & e & f \\ g & h & i \end{vmatrix} = 4$.