

UH - Math 4378/6309 - Dr. Heier - Spring 2011
HW 14 (final assignment)
Due **Monday, May 2**, at the beginning of class.

1. (2 points) Find a Jordan canonical form J and a Jordan canonical basis β for the operator $T : \mathbb{R}^6 \rightarrow \mathbb{R}^6$ given in standard coordinates by the matrix

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

2. (2 points) Find a Jordan canonical form J and a Jordan canonical basis β for the operator $T : \mathbb{R}^4 \rightarrow \mathbb{R}^4$ given in standard coordinates by the matrix

$$A = \begin{pmatrix} 0 & -3 & 1 & 2 \\ -2 & 1 & -1 & 2 \\ -2 & 1 & -1 & 2 \\ -2 & -3 & 1 & 4 \end{pmatrix}.$$

3. (1 point) Find a Jordan canonical form J and a Jordan canonical basis β for the operator $T : \mathbb{R}^3 \rightarrow \mathbb{R}^3$ given in standard coordinates by the matrix

$$A = \begin{pmatrix} 2 & 6 & -15 \\ 1 & 1 & -5 \\ 1 & 2 & -6 \end{pmatrix}.$$

4. (2 points) Find a Jordan canonical form J and a Jordan canonical basis β for the operator $T : \mathbb{R}^4 \rightarrow \mathbb{R}^4$ given in standard coordinates by the matrix

$$A = \begin{pmatrix} 3 & 0 & 0 & 0 \\ 1 & 3 & 0 & 0 \\ 0 & 0 & 3 & 0 \\ 0 & 0 & 1 & 3 \end{pmatrix}.$$

5. (1 point) Section 7.2, Problems 8a and 8b
6. (1 point) Section 7.3, Problem 2
7. (1 point) Section 7.3, Problem 10
8. (1 bonus point) Section 7.3, Problem 9