

UH - Math 4377/6308 - Dr. Heier - Spring 2020  
HW 7

Due 03/05, at the beginning of class.

Use regular sheets of paper, stapled together.  
Don't forget to write your name on page 1.

1. (1 point) Let  $T_1 : \mathbb{R}^2 \rightarrow \mathbb{R}^2$ ,  $T_1(a_1, a_2) = (a_1 + a_2, a_1 - a_2)$ . Let  $\beta = \{(1, 0), (0, 1)\}$  and  $\gamma = \{(1, 2), (1, 1)\}$ . Compute  $[T]_{\beta}^{\gamma}$ .
2. (1 point) Let  $T_2 : \mathbb{R}^2 \rightarrow \mathbb{R}^2$ ,  $T_2(a_1, a_2) = (2a_1 - 4a_2, -a_1 + a_2)$ . Let  $\beta = \{(1, 2), (-1, 1)\}$  and  $\gamma = \{(2, 1), (2, 0)\}$ . Compute  $[T]_{\beta}^{\gamma}$ .
3. (1 point) Let  $V$  be a vector space with the ordered basis  $\beta = \{v_1, \dots, v_n\}$ . Define  $v_0 = 0 = v_{n+1}$ . Let  $T$  be the unique linear transformation with  $T(v_j) = 2v_{j-1} - 3v_{j+1}$  for  $j = 1, \dots, n$ . Determine  $[T]_{\beta}$ .
4. (2 points) Section 2.2, Problem 13
5. (3 points) Section 2.2, Problem 15
6. (2 points) Section 2.2, Problem 16