

Matrices & Linear Algebra II
C Term, Section C01
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February 20, 2004

Linear Algebra Assignment 6

DUE DATE: Wednesday, February 25, by 4pm in my mailbox, SH108. Alternatively, you may hand your completed assignment to me personally.

Please keep in mind the presentation rules for assignments in this course.

The following problems are worth 10 points each.

- 1.) Problem #17 on p259. (Be careful! Think before you compute.)
- 2.) Problem #15(a) on p259. [Please give a careful proof.]
- 3.) Problem #22(a) on p260. (See the note below.)
- 4.) Complete parts (b), (d) and (f) of exercise #2 on p279.
- 5.) Complete exercise #7 on p280 with the given matrix replaced by the matrix

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

[HINT: First try to duplicate the answer in the back of the book for the given problem by expressing A as QDQ^{-1} for some change-of-coordinate matrix Q and some diagonal matrix D .]

Note: For a polynomial $g(t)$ and a linear operator T , $g(T)$ is defined on p565, in Appendix B.

For example, if $g(t) = 2t^3 - t + 4$, then

$$g(T) = 2T \circ T \circ T - T + 4I$$

where I is the identity transformation (also written id_V) and, for any vector u ,

$$g(T)(u) = 2T(T(T(u))) - T(u) + 4u.$$