

MATH 254: HOMEWORK

CHAPTERS 6 and 7

- The assignments for Chapters 6 and 7 are due on the day that you take Midterm 3.
- Answers to odd-numbered problems are in the back of the textbook.
- Show work where appropriate, **write your name on your homework**, and use the Student Solutions Guide wisely.

CHAPTER 6

Section 6.1 (p.334) #1, 3, 5, 7, 11, 15-23 odd, 31-35 all, 46, 47, 48

#11: No work is required.

Read Examples 9-11 on pp.333-334. (Example 10 relates to #35.)

Look at #49 and #60.

Section 6.2 (p.347) #1, 2, 3, 5, 6, 7-19 odd (see comment for #11 below), 25, 27, 33, 35, 38 (skip c), 47, 48 (skip b)

#11: You may use the fact that the row-reduced echelon (RRE) form for A is

$$\begin{bmatrix} 1 & 0 & 1 & 0 \\ 0 & 1 & -1 & 0 \\ 0 & 0 & 0 & 1 \\ 0 & 0 & 0 & 0 \end{bmatrix}$$

Section 6.3 (p.358) #1-19 odd, 25 (just find T ; skip T'), 31

You may use the shortcut for writing A that we discussed in class.

Section 6.4 (p.365) #1, 3, 5, 11, 13-17 all, 19, 21, 22, 26

#1, 3, 5: You should do b) as you do the work for a).

#14: Read the passage about diagonal matrices on p.364.

Section 6.5 (skip)

This section describes applications of linear transformations to geometry and computer graphics.

SEE BACK

CHAPTER 7

Section 7.1 (p.390) #3, 9, 11a, 13, 15, 17, 19b (see comments below), 31, 36, 44

#19: The two real eigenvalues are -3 and 3 ; you do not have to show this.
(See my handout on 7.1 to see how I got these eigenvalues.)
For each eigenvalue, give the corresponding set of eigenvectors.
That's all you have to do!

Read #7 and #35. You don't have to do anything.

Read my handout. You won't be tested on Factoring by Grouping, the Rational Zero Test, or Synthetic Division, but you may want to keep this info handy for future classes.

Section 7.2 (p.400) #1, 5, 7, 11, 15 (see comments below), 16, 17 (see comments below), 25 (see #11), 29, 30, 31, 35, 36, 37, 39, 41

#15, 16, 17: Give P and D ; you do not have to find P^{-1} or do the "Verify" step.
On #17, use my hint and your work for 7.1, #19!

#31: A great "application" of diagonalization!

Section 7.3 (p.412) #1-9 odd, 13, 15, 21 (see comments below), 22, 25 (see comments below), 29, 33, 34, 35, 37

#21: You may use your work from 7.2, #25.
#25: The eigenvalues are -15 , 0 , and 15 ; you don't have to show this.
#35: Notice that this is the rotation matrix from p.331.

Section 7.4 (skip)