MATH 341 SECTION
WRITTEN HOMEWORK 3
DUE OCTOBER 21, 2015.

INSTRUCTOR: ROBERT LIPSHITZ

Required textbook problems (hand these in):

- §1.7: 6, 9, 12, 15, 16, 17, 18, 19, 20, 24, 27, 28, 33, 34
  Note: in 15–20, “by inspection” means “just by staring at them, without doing any computation”. (i.e., by pure thought.) Do write a brief (one sentence) justification of why the vectors are or aren’t linearly independent.
- §1.8: 1, 4, 10, 12, 13, 14, 15, 16, 29, 32, 33
  Note: Most of these very quick if you understand what’s going on. In 32 and 33, “show that” means find one of the properties (i), (ii) that is violated by $T$, with specific $\vec{u}, \vec{v}$, and/or $c$.
- §1.9: 1, 2, 3, 4, 5, 6, 10, 11, 17, 25, 26, 29

Suggested practice (don’t hand these in):

- Please read and make sure you can do the practice problems in sections 1.8, 1.9, 1.10.
- Please read and use for review problems 1.7.21, 1.7.22, 1.7.29, 1.7.30, 1.7.31, 1.7.32, 1.8.7, 1.8.8, 1.8.21, 1.8.22, 1.9.19, 1.9.23, 1.9.24, 1.9.31, 1.9.32, 1.9.35
- If you had trouble or got help with any of the assigned problems, solve another, similar problem (or two).

**Bonus points.** As usual, bonus points for learning Sage.

1. Follow the steps in the post “Creating convenient matrices”.
2. Create a length 142 vector whose entries alternate 1, 2; 1, 2, . . . . Do not do this by typing 1,2 71 times: use operations on lists as explained in the post. Call your vector “v”.
3. Use Sage to verify that if $Z$ is the $3 \times 142$ zero matrix then $Zv$ is the length 3 zero vector.
4. Use Sage to verify that if $I$ is the $142 \times 142$ identity matrix then $Iv = v$. (In a correct solution, your worksheet should output “True” at a certain point.)
5. Extra optional: write a Sage function which takes as input a slope $m$ and returns the $2 \times 2$ matrix representing reflection across the line $y = mx$. (Hint: first figure out by hand what the matrix should be . . .)

E-mail address: lipshitz@uoregon.edu