

## MA 253 Homework Problems 8

Homework has both a “Reading” portion and a “Problems” portion. It is essential that you do the reading by the next class. The reading assignments are posted on a separate webpage. Don’t forget to do them!

All page numbers and section numbers refer to the 5th edition of Bretscher’s Linear Algebra. Note that most odd numbered problems have solutions in the back of the text. Problems without solutions are worth more points than those with solutions.

(1) Section 7.3 (page 345)

- (a) 3- 19 odd. You may use technology for these, but you should explain your work and state clearly where you used the technology.
- (b) 26, 28. (The algebraic multiplicity of an eigenvalue is the number of times it appears as the root of the characteristic polynomial. The geometric multiplicity is the dimension of its eigenspace.)
- (c) 35, 36 (Hint: look at the characteristic polynomials)
- (d) 39 (Hint: think about which vectors are scaled – possibly by 1 or 0 – by the transformation, those will be eigenvectors)

(2) Section 7.4 (page 355)

- (a) 1, 9, 11 (“closed form” means that the entries for  $A^t$  are explicit formulas in terms of the variable  $t$ .)
- (b) 34 (in part (b) you may just provide a numerical approximation to the time when the maximum is reached.)

(3) Section 7.5 (page 371)

- (a) Problems 1 - 4
- (b) Problem 7 (Hint: write the complex numbers in polar form)
- (c) Problems 20, 24, 26