

## ADDITIONAL PROBLEM SET (NOT HOMEWORK)

1. Do Exercise 8.2.21. in [OS18]. Hint: (a) False (b) True
2. Do Exercise 8.2.22. in [OS18]. Hint: it is false
3. Do Exercise 8.2.35. in [OS18]. Hint: first show that eigenvalues can be either 0 or 1
4. Do Exercise 8.2.40. in [OS18]. Hint: (a) you can explicitly construct an eigenvector (b) what is the relation of eigenvalues of  $A$  and  $A^T$ ?
5. Do Exercise 8.2.52. in [OS18]. Hint: do the calculation!
6. Do Exercise 8.3.6. in [OS18]. Hint: (a) True (b) False
7. Do Exercise 8.3.14. in [OS18].
8. Do Exercise 8.3.21. in [OS18]. Hint: conjugation by a permutation matrix can permute diagonal entries of a diagonal matrix
9. Do Exercise 8.4.4. in [OS18]. Hint: the converse is not true. Can you provide a counterexample?
10. Do Exercise 8.5.6. in [OS18]. Hint: you may want to mimic the proof for the symmetric case.
11. Do Exercise 8.5.13. in [OS18].
12. Do Exercise 8.5.19. in [OS18]. Hint: you may want to reverse the proof of the spectral theorem.
13. Do Exercise 8.5.26. in [OS18]. Hint: the answer is the identity matrix. Why?

— More Exercises Suggestions: 8.2.23, 8.2.25, 8.2.29, 8.2.33, 8.2.46, 8.2.50, 8.3.1, 8.3.2, 8.3.9, 8.3.13, 8.3.19, 8.3.26, 8.4.2, 8.4.12, 8.5.1, 8.5.5, 8.2.25

## REFERENCES

[OS18] Olver, P. J. and Shakiban, C., *Applied Linear Algebra*, 2nd ed., Undergraduate Texts in Mathematics, Springer, 2018.