

**MATH 2040C Linear Algebra II**  
**2017-18 Term 2**  
**Homework 4**  
**Due date: Mar 19, 2018**

The following questions are taken from our textbook “*Linear Algebra Done Right*” (3rd ed.) by Sheldon Axler. The book is available online via the CUHK library webpage. Please turn in your homework to the assignment box on 2/F of LSB by 5pm on the due date.

Questions marked with \* are optional. You do not need to submit the solutions of them. Some questions are not easy. You are encouraged to discuss them with other students. However, you must write down the solutions on your own.

Sec 5.A: # 2, 8, 15, 18\*, 20, 21, 29\*, 32\*;

Sec 5.B: # 1\*, 3, 9\*, 10, 11, 20;

Sec 5.C: # 6, 12, 16.

**Extra Question:** Determine whether each linear operator  $T$  on  $P_2(\mathbb{R})$  below is diagonalizable. If so, find an ordered basis  $\alpha$  such that  $M(T, \alpha)$  is a diagonal matrix.

I.  $T(p(x)) = p'(1)(x^2 - 5x) - p(x)$ ;

II.  $T(p(x)) = 2p(x) + (x^2 - 9)p(3)$ .

In addition to the questions above, you are advised to read all the exercises in the book and think about them.