MTH 451-551, Fall 2017, Assignment 5. Each problem is worth 10 points.

In this assignment you can practice your synthesis skills (read Lectures 18 and apply the theory developed there without it being repeated in lecture), as well as critical analysis skills (compare the example worked out in MATLAB in Lecture 19 to your own).

1. (451 and 551) Solve 18.1 a-d. (551 additionally solve 18.1e.)

2. (Computational) (451 and 551) Repeat example in Lecture 19, but (i) without the normalization step, and with $b = exp(sin(10t))$ instead of what is in the book. For each method, reconstruct the polynomial with the coefficients provided from your Least Squares solution and plot its graph next to b, against t. **Discuss!** Your discussion sh(/c)ould include the following "analysis". Which condition numbers on p138 natch your problem? Which result seems most accurate based on Lecture 19 and your experiments? Do we even know for sure? Is your problem better conditioned than that in the book or worse? If you were to normalize, how would you do it?

(451 can skip the use of Gram-Schmidt. 551 refer to the earlier HW where you coded Gram-Schmidt in a loop).