MATH 613. Fall 2021.

Homework #3. Due: October 19, in class. No late homework will be accepted.

Please write down clearly or type your solutions. It can be considered incorrect if it is hard to read. Collaboration is allowed, but everyone must write down and submit his/her solutions in his/her own words.

If you want to submit a hard copy, please write down your name and staple your sheets together before you submit your homework. If you want to submit this assignment electronically, you should submit it through Gradescope.

All the questions mentioned below are in the Exercise part of the corresponding sections in the textbook.

- Required submission questions:
  - Section 4.2: 13, 15, 18, 28.
  - Section 4.3: 13.

  (Remark:
  - Hint for 4.2.15: Block-structure of $G - v$.
  - For 4.2.18, add an extra assumption that G is loopless (for otherwise the question is false).
  - For any problem, you can use Lemma 4.2.3 in the textbook without including its proof. You can also try to figure out how to prove Lemma 4.2.3 on your own. It is easy.

    Here is a restatement of Lemma 4.2.3 (in case you don't have the textbook): "Let k be a positive integer and let G be a k-connected graph. Define G' to be a graph obtained from G by adding a new vertex y and new edges such that y is adjacent in G' to at least k vertices in G. Then G' is k-connected."
  - You can use any theorem in the lecture notes posted at Canvas without including its proof.)

- Suggested practice:
  - Section 4.2: 8, 9, 11, 14, 19, 20, 21, 26, 27, 31, 34, 36, 37.
  - Section 4.3: 15.