

MATH 613. Fall 2021.

Homework #6. Due: December 7, 9:35am. 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.

This homework must be submitted to Gradescope.

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

- Required submission questions:

- Section 5.1: 20, 43, 50.
- Section 5.2: 27, 32.

(Hint for 5.2.27: The condition $n \geq 6$ is only used when proving $n + 3$ is a lower bound. When proving that $n + 3$ is an upper bound: forget about the condition for $n \geq 6$ and prove it by induction on n . Prove that the minimum counterexample contains a subdivision of K_4 and work on this subdivision to obtain a subdivision of $K_{3,3}$. Then work on this subdivision of $K_{3,3}$.)

Remark for 5.2.32(a): Add the condition $k \geq 3$, for otherwise the statement is false.)

- Suggested practice:

- Section 5.1: 22, 23, 25, 26, 27, 32, 33, 38, 40, 41, 44, 51, 55.
- Section 5.2: 9, 11, 12, 14, 15, 17, 34, 40.