

Math 154, Spring 2021 HOMEWORK #5 due Thursday, May 13

- Q1. (8pts) Solve Question 6.1 from the textbook, explaining how you know you have found $\chi(G)$ and $\chi'(G)$ (finding a coloring is not enough; explain how you know you cannot color with fewer colors!)
- Q2. (12pts) Solve Question 6.8 from the textbook. You may assume that $\chi'(K_n) = n$ when n is odd. For part a), use the same considerations as when we did something similar for $\chi(G)$ in class. For part b), consider how many edges need to use a specific color.
- Q3. (5pts) Find a graph with chromatic number 5 which does not contain any K_5 subgraph. Explain why its chromatic number is 5. (Hint: start with a 5-cycle, and add 2 vertices; figure out how to add edges to get what you want.)
- Q4. (5pts) Solve Question 6.10 part a) only.