CSDS 455: Applied Graph Theory
Homework 18
Due Monday, October 26 at the start of class

Homework rules: You are welcome to work with others to solve these problems. If you do get help from someone else (or from some other resource), please indicate that on your homework.

Next week we will be discussing minors. Please skim through your text's sections on minors and topological minors.

Problem 1: Let G be a chordal graph. Let G_0 be the graph created by taking G and performing a sequence of edge contractions. Prove that G_0 is also chordal.

Problem 2: Let G be a planar graph. Prove that any minor of a planar graph must also be planar. (Don't use Kuratowski's Theorem.)

Problem 3: Prove that if any graph G with $\chi(G) \geq k$ contains a K_k minor, then any graph G' with $\chi(G') \geq k-1$ must contain a K_{k-1} minor.

Problem 4: Use induction on the number of vertices of G to prove that if G does not contain a K_4 minor then G is 3-colorable.