Worksheet/Homework for Lecture 14/15

Comments and/or partial solutions are due by Monday morning. Full solutions are due by Thursday night.

Problems:

1. Show that if G is complete, then G has a vertex cut.
2. Draw a non-complete graph which is 3-connected, but not 2-connected.
3. Draw a non-complete graph with $\lambda(G) = 2$ and with every minimal edge cut a minimum edge cut.
4. Explain why $\delta(G) \geq \lambda(G)$.
5. Can you find a graph with $\kappa(G) = 2, \lambda(G) = 3, \delta(G) = 2$?
6. Can you find a graph with $\kappa(G) = 2, \lambda(G) = 2, \delta(G) = 3$?
7. Prove that if G is k-connected and $v \in V(G)$ then $G - v$ is $(k-1)$-connected.
8. Suppose G is a graph with n vertices, and v is a vertex of degree $n - 1$. Does every edge cut need to contain an edge incident to v? Why or why not?
9. Show that if G is a connected graph with at least 4 vertices, with $\delta(G) = 2 = \Delta(G)$, then $\lambda(G) = \kappa(G) = 2$.