University of Konstanz
Department of Computer & Information Science
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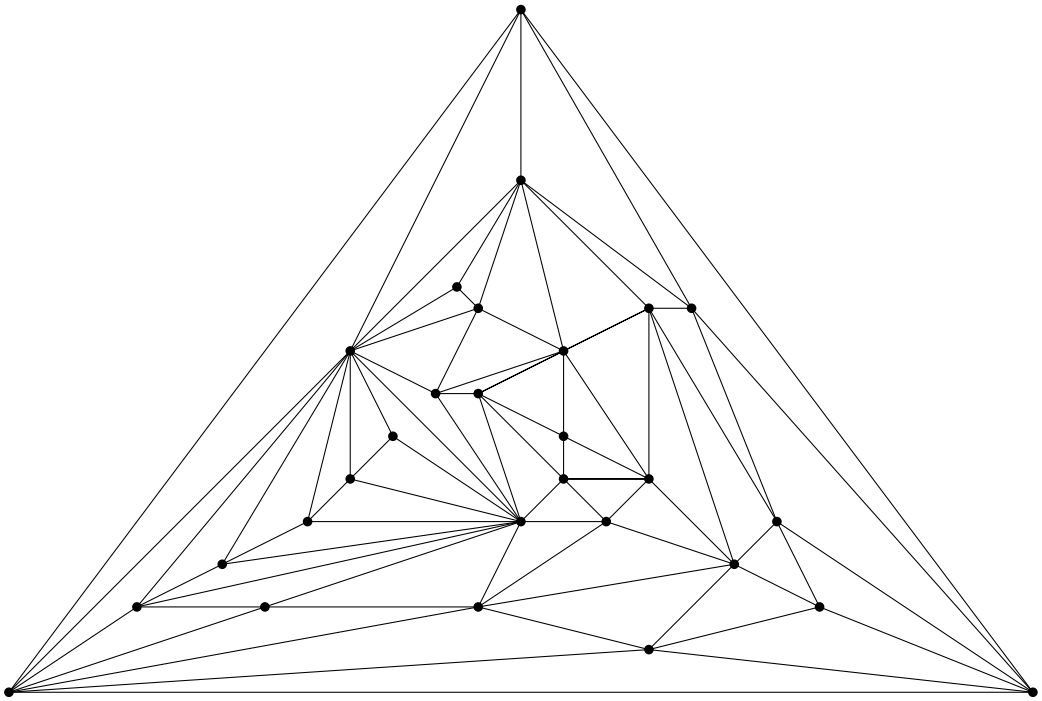
Algorithms for Planar Graphs
Summer 2017

Assignment 11

Post Date: 10 July 2017 **Due Date:** 17 July 2017 **Tutorial:** 19 July 2017

Problem 1: Separators — 6 Points

Apply the algorithm from the lecture (see the last slide for a summary) to find a $\frac{3}{4}$-balanced cycle separator of size $\leq 4\sqrt{|V|}+1$ in the following graph (all faces have the same weight and all nodes and edges have weight 0).



Problem 2: Balanced Planar Separator — 4 Points

(a) Prove or disprove that for every planar graph with $n \leq 9$, there exists a 2/3-balanced separator of size $\leq \sqrt{n}$.

(b) Can you find a planar graph with $n > 9$ vertices that does not have a 2/3-balanced separator of size $\leq \sqrt{n}$? Explain why your example is correct or argue why such an example does not exist.