

CSE 2500: Problem Set Nine

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Due: Nov. 13

Exercise 1

Recall that a 2-connected graph is a graph with no “single point of failure”, i.e., removing any vertex retains the connectivity of the graph. A graph G that is 2-connected is called critical if in case you remove any edge e from G the resulting graph is not 2-connected anymore. For example the cycle graph on n vertices C_n is a critical 2-connected graph: if you remove any edge the graph is not 2-connected. For any $n \geq 2$ find an example of a critical 2-connected graph that has one vertex of degree n . You may give an explicit definition of these graphs or describe them through drawings as long as it becomes obvious how the result generalizes. You should also draw such graphs for the cases $n = 2, 5, 7$.

Clarification. The graphs you will construct for each n can have as many edges and vertices you like (the only constraint is the existence of a single vertex of degree n and the fact they are critical 2-connected).