

Homework VII

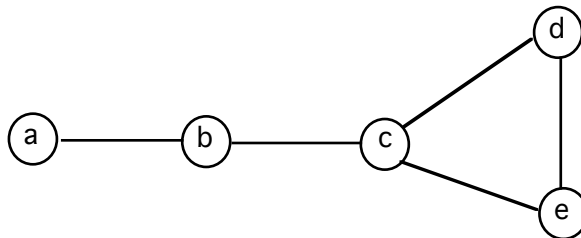
1. [15 points]

Show that a longest simple path in a (free) tree starts and ends at a leaf node.

2. [20 points]

Let $G = (V, E)$ be a (simple) graph and define the following relation on V : $(v_1, v_2) \in R$ if there is a *simple* path of *even* length (including length 0) between v_1 and v_2 .

- (a) Determine the pairs of this relation for the graph below; is it an equivalence relation?



- (b) Show that for any (free) tree, this relation is an equivalence relation on the vertices.

3. [20 points]

Problem 1, page 407 of our text.

4. [20 points]

Trace Dijkstra's algorithm for finding a shortest path from node a to node d in the digraph below.

