

- This homework set has *three* questions, each one with increasing difficulty. You must work in pairs to determine the solutions.
- Every member of the team must be able to explain how you arrived at the answer.
- You may be asked to present your answer on the blackboard.

1. Show that the finite trees are not well-quasi-ordered by the subgraph relation.
2. Let u and v be two vertices of a graph G , connected by more than $k + 1$ vertex-disjoint paths. Show that any tree decomposition of G of width at most k must contain a bag X with $u, v \in X$.
3. Show that the finite graphs are not well-quasi-ordered by the topological minor relation.