

Groupwork 8 Problems

1. Commit Tea Party [15 points]

Two committees are having a meeting. If there are 12 people in each committee, how many different ways can they sit around a table given the following restrictions? Note that two orderings are considered equal if each person has the same two neighbors (without distinguishing their left and right neighbors).

- (a) There are no restrictions on seating.
- (b) Two people in the same committee cannot be neighbors.
- (c) Everybody must have exactly two neighbors from their committee.
- (d) Everybody must have exactly one neighbor from their committee.

Solution:

2. Hiking Extravaganza [15 points]

Prove that every complete n -node weighted graph (with all possible edges) with $n \geq 1$ and all distinct edge weights has a (possibly non-simple) path of $n - 1$ edges along which the edge weights are strictly increasing.

Hint: Start by placing a hiker on each node. Try to show that the hikers can walk paths of *total* length $n(n - 1)$, each along increasing-weight paths.

Solution:
