

WEEK 5 (OCT 10-OCT 16)

Below is a screenshot of the calendar from the syllabus. I am throwing this in case you have missed the calendar in the syllabus. Note that the schedule is tentative. We will continue with [Graph Theory \(Chapter 5\)](#) this week and next week.

Calendar

This is a tentative schedule for the term.

Week	Textbook Section	Evaluation	Note
Sep 12–Sep 18	2		
Sep 19–Sep 25	2		
Sep 26–Oct 2	3	PS 1 due on Oct 2	
Oct 3–Oct 9	4.1, 5		
Oct 10–Oct 16	5	PS 2 due on Oct 16	No lecture on Oct 10
Oct 17–Oct 23	5		
Oct 24–Oct 30	7	Midterm project due on Oct 24	
Oct 31–Nov 6	8	PS 3 due on Nov 6	
Nov 7–Nov 13			Reading week
Nov 14–Nov 20	9	PS 4 due on Nov 20	
Nov 21–Nov 27	9		
Nov 28–Dec 4	10	PS 5 due on Dec 4	
Dec 5–Dec 9	10		Make up class on Thursday

Week 5. Since there is only one lecture on Week 5, there is not much we can do. But we will continue with Graph Theory. This is what you need to know for the week.

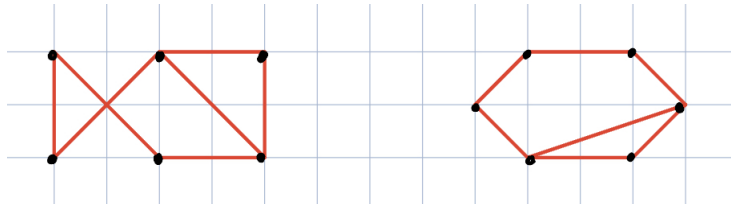
1. Read the notes of Lecture 8 and start reading [Chapter 5](#). Read the definitions of
 - Subgraphs (it was not done in class, but you should read the definition nevertheless).
 - Isomorphisms
 - Degree of a vertex (again this wasn't done in class, but you are expected to read it).
2. Look up the definition of Hamilton and Euler paths. Look up also the statement of Euler's result, namely that a graph has a cycle which traverses each edge exactly once if and only if it is connected and every vertex has even degree. This of course means looking up the definitions of all the new terms thrown in (cycle, edge, vertex, degree, connected)

Problems worth thinking about. Here are some problems you might wish to think about. You are not expected to submit the solutions of these problems. They are for practice, and for helping you understand the lectures. Even if you do not

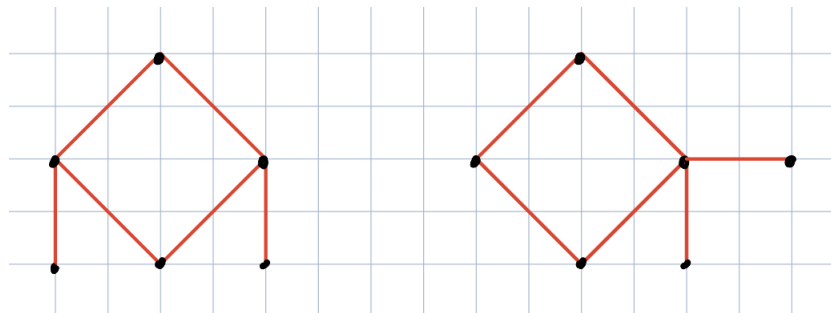
succeed in solving them, puzzling over them will be very helpful. You can ask for help with these during the various office hours.

1. Are the following graphs isomorphic? Why or why not?

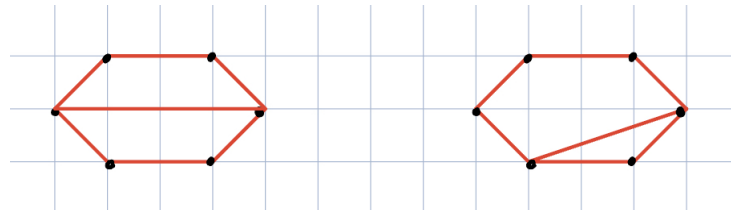
(a)



(b)



(c)



2. Suppose there are seven committees with each pair of committees having a common member and each person being on two committees. How many people are there. (Despite appearances, this is a graph theory problem.)
3. Suppose a graph $G = (V, E)$ is such that every cycle is of even length. Show that V can be written as $V = V_1 \cup V_2$, with $V_1 \cap V_2 = \emptyset$, such that every edge joins a vertex in V_1 to a vertex in V_2 .