

# HW4

Graph Theory (Fall 2019)  
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Due: Thursday, November 7, 2019, in class

1. Show the steps of the augmenting paths algorithm on each of the following: Problems 8.2, 8.3
2. Problems 8.4, 8.5
3. Show that the edge set of any 3-regular bipartite graph can be written as the union of 3 perfect matchings.
4. Show that if a bipartite graph has a matching of size  $a$ , then every maximal matching in the graph has size at least  $a/2$ .  
Give an example of a bipartite graph that has a matching of size 10 and a maximal matching of size 5.
5. How many perfect matchings does  $K_{n,n}$  have?