Problem set 5

This problem set is due on **Thursday May 13, 2021**. Instructions are the same as the first pset; some key points: collaboration is encouraged but you **must** write up your answers in your own words. You are required to list and identify clearly all sources and collaborators except instructors, TA or lecture notes. Each question is worth 4 points and each extra credit question is worth 2 points.

1. Exercise 5-5 of the notes on matroids.

2. Exercise 5-7 of the notes on matroids.

3. Exercise 5-8 of the notes on matroids.

4. Show the derivation of Theorem 6.3 from Theorem 6.1, from the notes on matroid intersection.

5. (**Extra Credit**) Exercise 5-12 of the notes on matroids.

6. (**Extra Credit**) Use Theorem 6.8 from the notes on matroid intersection to show that if $G = (V, E)$ is a graph with $|E| \geq 2|V| - 2$, such that for every nontrivial subset $S \subsetneq V$ the number of edges of G with both endpoints in S is at most $2|S| - 2$, then G has two edge-disjoint spanning trees.