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 $S \subset V$ 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.