Homework 6

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Graph Theory

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Problem 1 See attached sheet for Male and and Female perfect matchings

Problem 2

Claim All $k-$regular bipartite graphs satisfy Tutte's Condition.

Proof. Suppose G is a $k-$regular bipartite graph where k is a positive integer. Consider some $S \subseteq V(G)$ with some odd component. □

Problem 3

Claim Suppose G is a $7-$regular connected graph that remains connected after deleting 5 edges. Then G has a perfect matching.

Proof. □

Problem 4

Claim There exists a $5-$regular simple connected graph that remains connected after deleting any 2 edges but does not have a perfect matching.

Proof. See attached sheet for drawing. □

Problem 5

Claim

Proof. □