

Homework 11 : Due Wednesday, May 6

Extra Problem: One can ask if Hall's Theorem (Theorem 3.1.11) works for (countable) infinite bipartite graphs. In doing so, one should interpret $|S| \leq |N(S)|$ as saying that if S is infinite, then $N(S)$ is also infinite. Show that the result is false by constructing an X, Y -bigraph G on a countable vertex set (say $V(G) = \mathbb{N}$) such that $|S| \leq |N(S)|$ for all $S \subseteq X$, but for which there is no matching that saturates X . (Feel free to ask for a hint if you would like one.)