

Problem Set 2

MATH 777, Spring 2008, Cooper

Expiration: Friday, March 14

Each problem is worth 20 points. Rigorous proofs are required for all claims, although elegance and concision are nearly as important. You may only use results we proved in class, or which can reasonably be considered prerequisite material for this class, unless otherwise stated. You will receive 5 bonus points for submitting your solutions in LaTeX.

1. Diestel §6, #9.
2. Diestel §6, #10.
3. Diestel §6, #12.
4. Diestel §6, #17.
5. Show that every cubic bridgeless G is the union of two (possibly intersecting) families of vertex-disjoint cycles and a subdivision of some bipartite cubic multigraph. (Hint: Apply Seymour's Theorem with the right group. Note that Proposition 6.4.2 holds for multigraphs.)
6. The Möbius Ladder graph M_n is defined to be

$$(P_n \square P_1) \cup \{ \{(1, 2), (n + 1, 1)\}, \{(1, 1), (n + 1, 2)\} \},$$

where $V(P_k)$ and $[k + 1]$ have been identified in the natural way. What is $\phi(M_n)$?