

1025-05-45

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We investigate how certain results related to the Hanani-Tutte theorem can be extended to surfaces other than the plane. We give a new simple, topological proof that the weak Hanani-Tutte theorem is true on arbitrary surfaces, both orientable and nonorientable. We apply these results and the proof techniques to obtain new and old results about generalized thrackles, including that every bipartite generalized thrackle in a surface  $S$  can be embedded in  $S$ . We also extend a result of Pach and Tóth that allows the redrawing of a graph so as to remove all crossings with even edges to arbitrary surfaces. From this we can conclude that  $cr_S(G)$ , the *crossing number* of the graph  $G$  on surface  $S$ , is bounded by  $2ocr_S(G)^2$ , where  $ocr_S(G)$  is the *odd crossing number* of  $G$  on surface  $S$ . Finally, we prove that  $ocr_S(G) = cr_S(G)$  whenever  $ocr_S(G) \leq 2$ , for any surface  $S$ . (Received January 09, 2007)