1020-05-141 **Helene Barcelo*** (barcelo@asu.edu), Department of Mathematics & Statistics, P.O. Box 871804, Tempe, AZ 85287-1804, and **Shelly Smith** (smithshe@gvsu.edu), Department of Mathematics, Grand Valley State University, Grand Rapids, MI 49401-9403. *The Discrete Fundamental Group of the Order Complex of B_n.*

We prove combinatorially that the first Betti number of the complement of the 3-equal arrangement is equal to $2^{n-3}(n^2 - 5n + 8) - 1$. This formula was originally obtained by Björner and Welker in 1995. We use a notion of discrete homotopy to reformulate the problem into one of counting certain equivalence classes of 6-cycles in the graph corresponding to the 1-skeleton of the permutahedron. We then use the language of words, over the alphabet of simple transpositions, to obtain necessary and sufficient conditions to determine if two 6-cycles belong to the same class. The proof requires only simple combinatorial arguments. (Received August 24, 2006)