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The parity theorem shuffle.

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Summary: The Parity Theorem states that any permutation can be written as a product of transpositions, but no permutation can be written as a product of both an even number and an odd number of transpositions. Most proofs of the Parity Theorem take several pages of mathematical formalism to complete. This article presents an alternative but equivalent statement of the Parity Theorem, replacing “transposition” with “adjacent transposition,” as well as a proof based on an inversion count technique. To build an intuitive understanding of the concept of inversion and to help students discover the Parity Theorem on their own, this article presents a series of five classroom activities based on the group-building initiative “Telephone Pole Shuffle.”

Classification: H45

Keywords: abstract algebra; permutation; parity; inversion; ropes course

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