

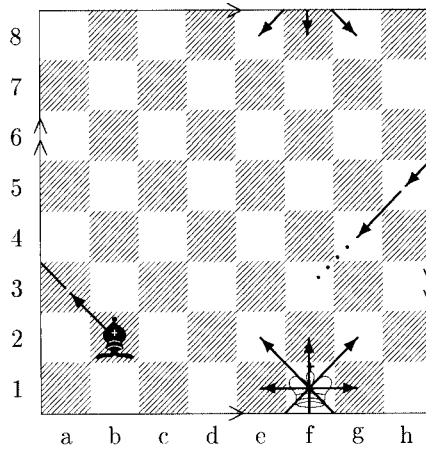
Ein Kleines Schach

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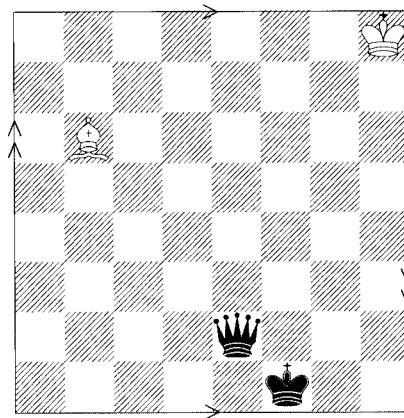
This column is a place for those bits of contagious mathematics that travel from person to person in the community, because they are so elegant, suprising, or appealing that one has an urge to pass them on.

Contributions are most welcome.

Want to play a little chess—with a twist? The two chess puzzles below are played on a Klein bottle. That is, the top edge wraps around cylindrically to the bottom edge, and the right edge wraps around in Möbius-strip fashion to the left edge. So, for example, a king on f1 can move directly to e8, f8, or g8, and a bishop traveling from b2 to a3 can continue on to h5, g4, f3, etc.

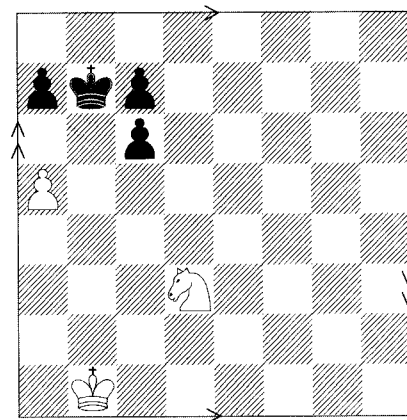


Problem 1



White to move and mate in 1. Two solutions.

Problem 2



Helpmate (Black to move).

Problem 2 is a helpmate; that is, it is Black's turn to move, and White and Black *cooperate* to checkmate Black. (This may seem like an unusual stipulation, but among chess problem specialists, helpmates are a familiar and standard genre.) How quickly can Black be checkmated? Note that if it were White to move, Nc5 would be immediate mate—but it is Black to move. All three Black pawns are moving down the board, and the White pawn is moving up the board.

If these problems were a breeze for you, try playing against the computer at Jeffrey Weeks's Web site at <http://geometrygames.org/TorusGames/html/Chess.html>

The Solutions appear on page 69.

Please send all submissions to the Mathematical Entertainments Editor, **Ravi Vakil**, Department of Mathematics, Stanford University, Stanford, CA 94305-2125, USA e-mail: vakil@math.stanford.edu