Hanging a Picture

History and provenance

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A documented early source

Demaine and coauthors' *Picture-Hanging Puzzles* (2012) credits A. Spivak with posing the two-nail puzzle in 1997 [1]. Their paper develops generalizations involving many nails and prescribed conditions for when a picture falls.

The mathematical connection

The puzzle is an accessible example of how loops around separate obstacles depend on their order. The four-part route in the solution is a *commutator*: go around one obstacle, then another, then reverse the first trip and reverse the second. Removing either obstacle makes the remaining trips cancel.

This is why counting clockwise and counterclockwise turns separately misses the point: the order of the trips carries information.

The 1997 attribution is reported by the cited research paper. This note does not independently establish whether an earlier informal version circulated. The accompanying explanation and notation were newly written for this page; the underlying construction is established puzzle mathematics.

Sources

[1] Erik D. Demaine and collaborators, Picture-Hanging Puzzles, FUN 2012.
https://erikdemaine.org/papers/PictureHanging_FUN2012/paper.pdf

Sources checked September 7, 2026. A documented appearance is not necessarily the earliest appearance.