

A MAGICALLY IMPOSSIBLE HOLE!

What is the largest hole you can cut in a piece of paper? Big enough to put your hand through? Your head through? How about one big enough to walk through? Impossible, right? Not with math!

This is more of a puzzle than it is an actual magic trick, but it's still fun to do.

To do the trick, the mathemagician asks the audience if anyone thinks they can cut a piece of regular paper with a hole big enough for him to walk through. Let the audience members try – most will just cut the inside area of the paper out, giving a hole just smaller than the piece of paper.

Then the magician snips a piece of paper along the lines on the template (he can either use the template or memorize the snips) and walks through the giant hole that's created!

The best way to do this is to fold the paper in half the long way and cut along the black lines that zig-zag along the folded sheet. Then cut along the fold, without going all the way through. It should look like this:



When you unfold it, it will be like a long ribbon. And will open to a giant hole!

The math behind this trick comes down to the question What is a hole? To most people, a hole is empty space. But to a mathematician, holes are defined more by the boundary or edge that makes the hole rather than by the empty space inside. When you cut out the middle of the paper, you throw away paper that could be used as boundary. Cutting it like in the template uses all the paper as boundary. Give it a try!

