

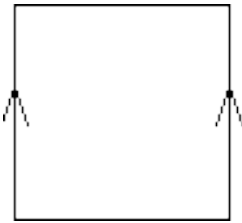
Gluing Diagrams and New Ways to Play Tic-Tac-Toe

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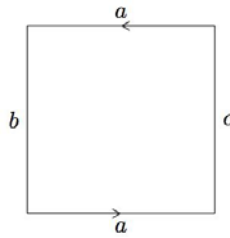
A. Gluing diagrams are a way to represent some more complicated surfaces by drawing a flat image.

1. What will the following gluing diagrams look like when glued?

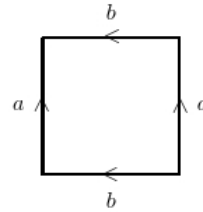
a.



b.



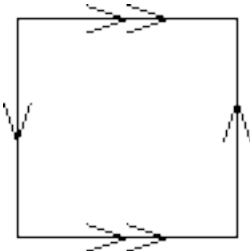
c.



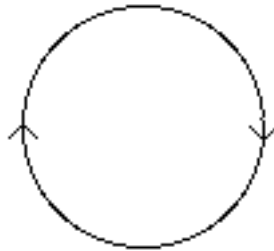
d. What about the plane with the unit circle glued together into one point?

2. What about these (more complicated) surfaces?

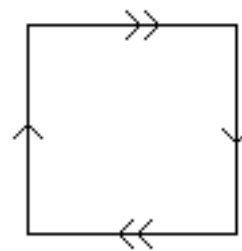
a.



b.



c.



B. Tic-Tac-Toe

1. If we play Tic-Tac-Toe on a cylinder, what new moves become available?

2. If we play Tic-Tac-Toe on a Möbius band, what new moves become available?