

Closed Saddle Connections on the Dodecahedron: Representative Figures

Jayadev S. Athreya, David Aulicino, and W. Patrick Hooper

This document contains a representative of a closed saddle connection in each of the 31 equivalence classes found in Theorem 1.1 of the authors' paper. The page numbers correspond to the numbers of the equivalence classes in Appendix C of that paper.

Instructions for Students: You will need scissors, clear tape, and a one-sided print out of this document. The figures on each page are called nets. They result from cutting along the sides of a solid shape until the polygons on the sides of the solid can lie flat on a table; you could think of a net as a flat, two-dimensional “pattern” that you can fold up to make a three-dimensional figure. Click the following link for an animation of this process on the dodecahedron:

https://en.wikipedia.org/wiki/Regular_dodecahedron

First Activity: To make each dodecahedron, cut out the net on each of the following pages. Then, fold along the dotted edges in each net – this will make the next step easier. Finally, tape the pentagon edges together to complete the dodecahedron, again the animation in the link above may help. All of the black lines in the figures should perfectly line up to form a continuous path.

Second Activity: In this activity, start by cutting out any pair of adjacent pentagons from the 3-dimensional dodecahedron you built in the first activity; adjacent pentagons are pentagons that share an edge. Observe that if you did this correctly, the black lines on each pentagon should form straight lines across both pentagons! The net of the first dodecahedron on page 1 below can be rearranged into the one in Figure 1 in the paper that can be downloaded at the following link:

<https://arxiv.org/abs/1802.00811>





























































