

Out[2021]=

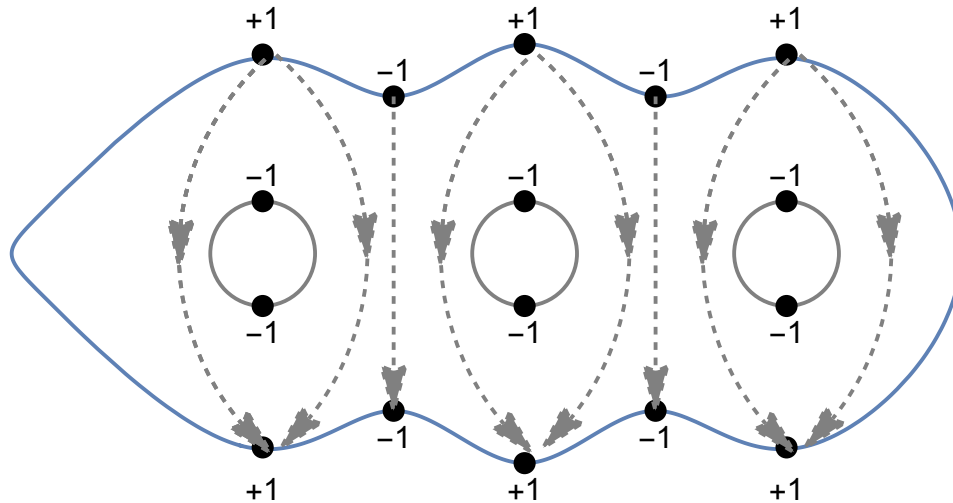


Figure 1. Honey-flow on surface of genus three

30. Honey-Flow on S_g . Take S_g in [19.11] and rotate it by a right angle about an axis perpendicular to the page, so that the holes are aligned horizontally, instead of vertically. Sketch the new honey-flow, and deduce that there are a total of $6g - 2$ singular points.

The 16 singular points are shown in Figure 1 with the flow indicated by dashed arrows.

$$6g - 2 = 18 - 2 = 16$$

Confirm that the sum of their indices is indeed $\chi = 2 - 2g$, in accord with the Poincaré Theorem.

The index of each singular point appears over or under the point. There are three sources (+3), three sinks (+3), and 10 saddles (-10) for a total of -4. The surface has genus 3.

$$\chi = 2 - 2g = -4 \text{ (Euler's formula)}$$

$$\sum I(S_g) = 3 \text{ src. (+1 ea.)} + 3 \text{ sinks (+1 ea.)} + 10 \text{ saddles (-1 ea.)} = -4$$