Homework 5

Knot Theory - Atkinson

Due Friday, March 9

Remember to follow the guidelines given in the first assignment.

(1) Exercise 4.10 on page 83.

(2) Exercise 4.16 on page 92 (find the genus, number of boundary components, and whether or not each surface is orientable).

(3) Draw a sequence of pictures to show that the gluings of the hexagon shown below yield a torus.

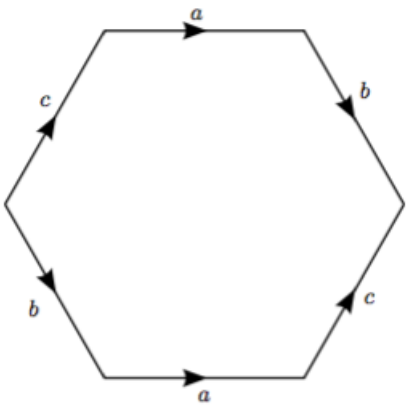

FIGURE 1.

Assignment continues on next page

(4) Draw a sequence of pictures to show that the gluings of the octagon indicated below yield an orientable surface of genus 2.

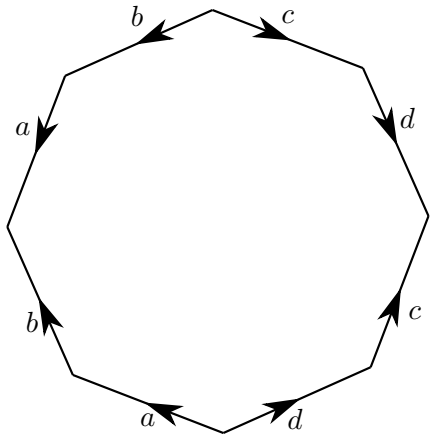

FIGURE 2.

(5) In class we'll see that a torus with one boundary component is the same as two loops of paper "fused" together. We'll see this by expanding the "puncture" until it nearly filled the surface. See figure 4.34 on page 87.

Give a similar description of an orientable genus 2 surface with one boundary component where the missing disk has been expanded to nearly fill the surface. Your description should include a drawing. It may be helpful to use number 4 for this.