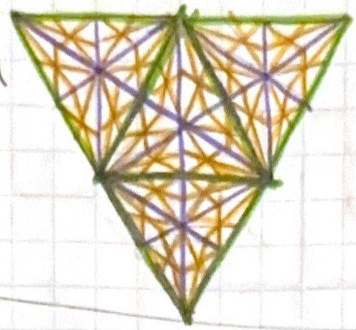
Homework #15

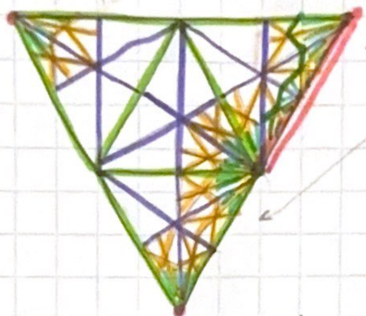
Original
First Bary Centric Subdivision
Second Bary centric Subdivision

1) a

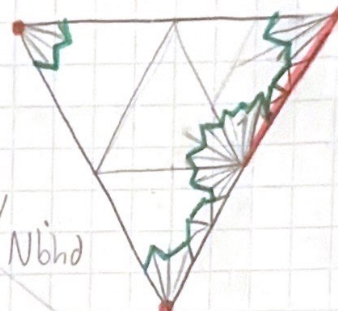


Subdivisions

b)



← these edges end up being the same along with all outside Vertices as the are 1 point



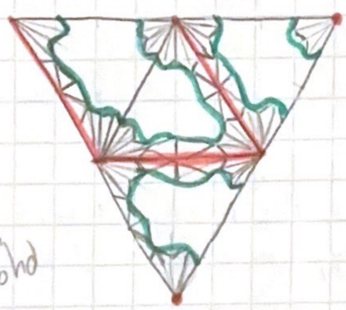
edge w/ Nbhd

Basically, you have this shape

around the vertices, an along the edge, this shape connecting the

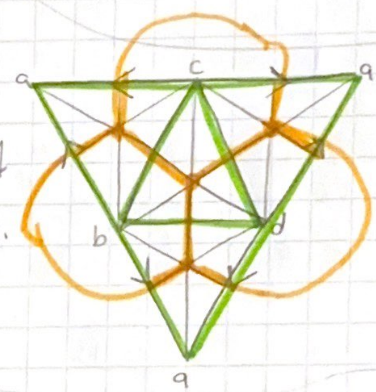
two vertice parts.

c)

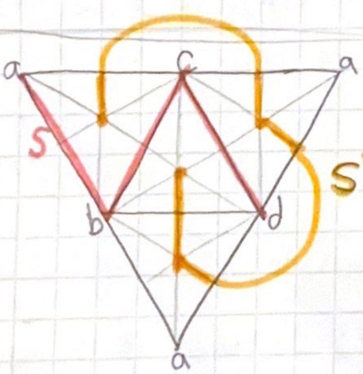


Tree w/ Nbhd

d)



Dual-1 skele.

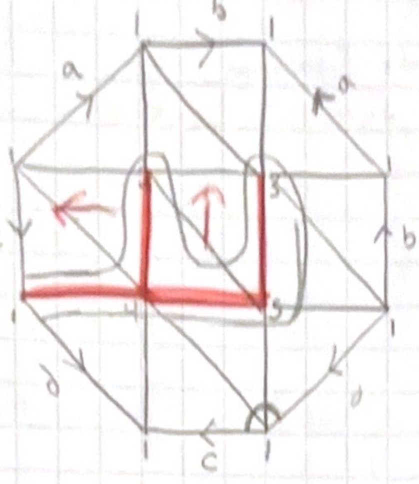


e)

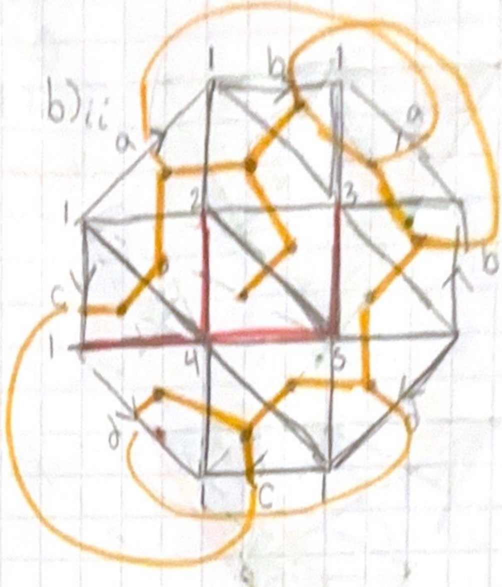
f) This manifold has no "handles", because S' is a tree, there are no cycles!

2a) Convinced :)

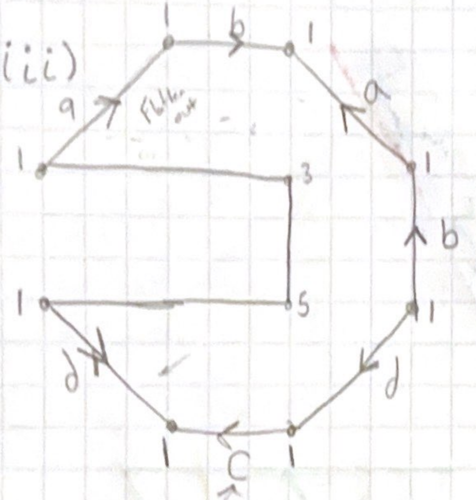
b) i

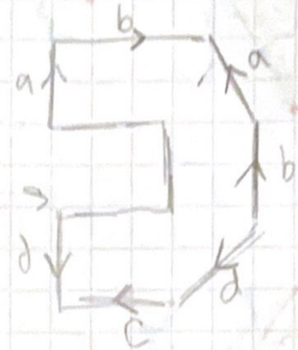


b) ii

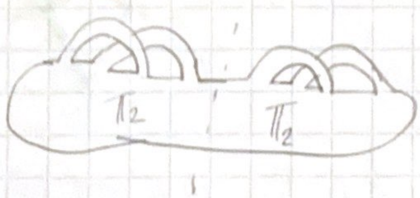


iii)

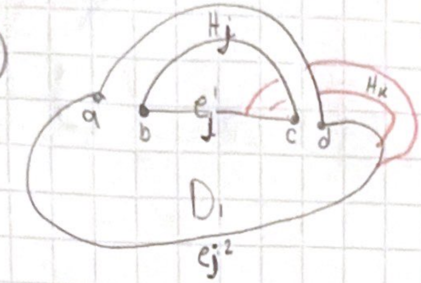




Here's where I am getting stuck. To me, the resulting diagram looks as though we are going to end up with 4-handles, where both of them are sets of entwined handles like. However, I am struggling to get my diagram to do that.



iv) No, it is not suprising to me. If 1 torus has 2 handles, then a double torus should have 4 (2 sets of 2) because it is basically just 2 tor. glued together.

3) 

then H_K must exist.

Assume that H_j is attached to D_1 with no twists, but H_K doesn't exist.

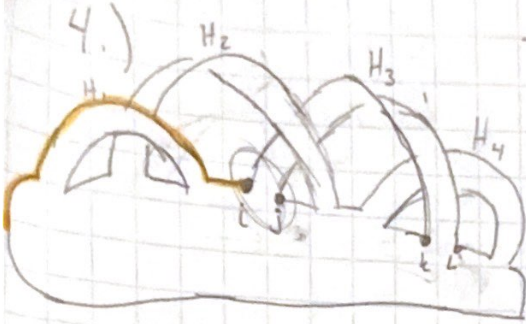
So, any additional strip we add, must be only on e_j^1 or e_j^2.

For ease of drawing, I'm going to use e_j^2. Because Thrm. 15.1.6 says that $D_1 \cup ((\bigcup_{i=1}^{k-1} H_i))$ is connected, any new strips, H_i that we add, must allow for e_j^1 to connect to e_j^2.

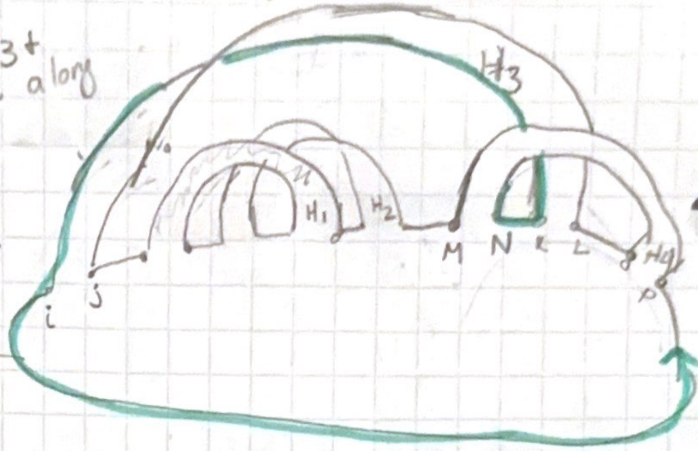
However, this can't happen unless we have a strip H_K that attaches to both e_j^1 + e_j^2, which is a contradiction to our assumption.

So, if there is a strip H_j attached to D_1 with no twists, then H_K must be attached to both e_j^1 + e_j^2.

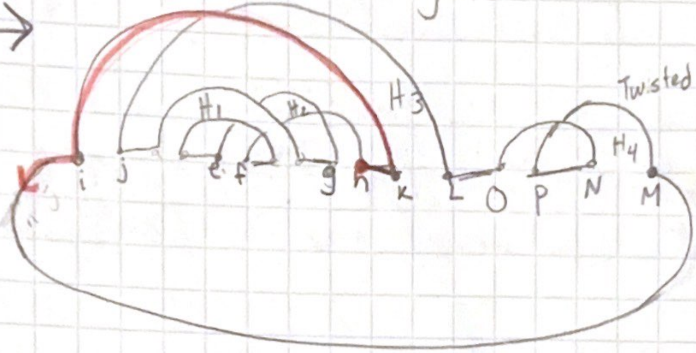
4.)



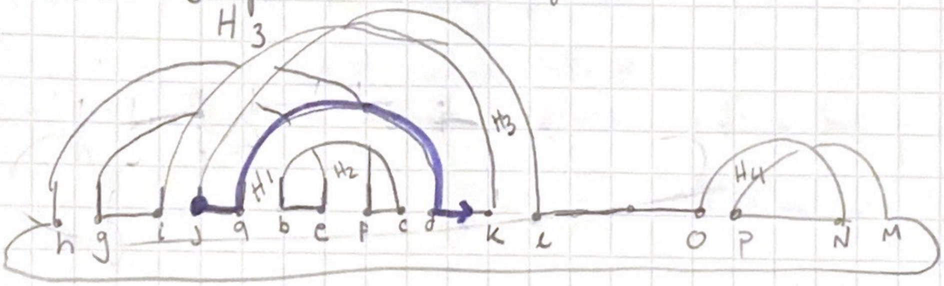
Take H_3 + slide along H_1



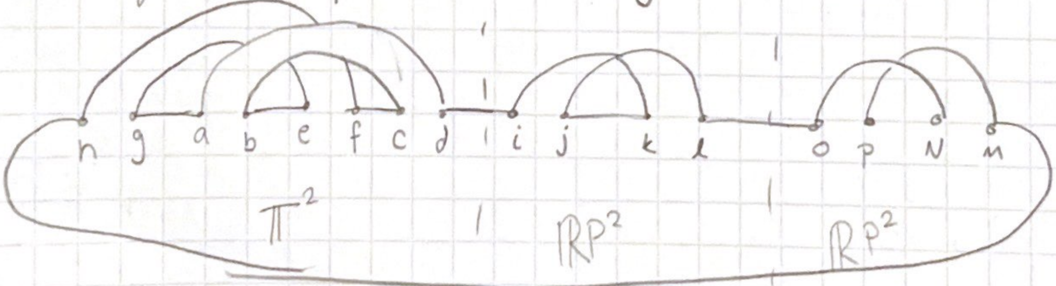
Next, take M, N of H_4 + slidealong $H3$



Take h, g of H_2 and slide alonge H_3



Finally, take j, i from H_3, + slide along H_1



So, you have a Torus + 2 Projection Planes together!

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