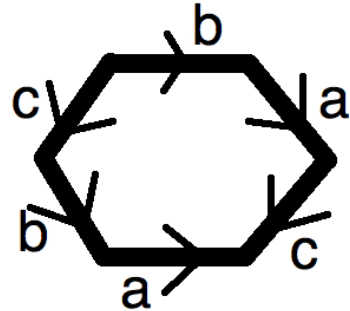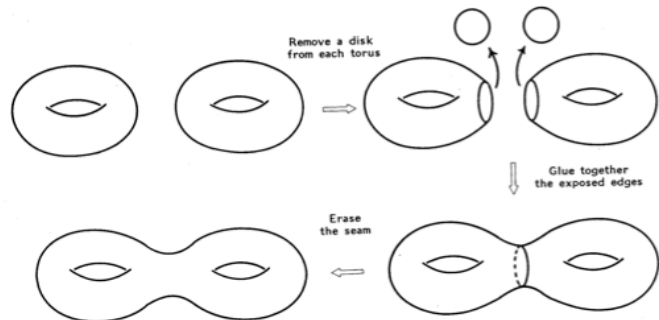# Connect Sums

While working in a group make sure you:

- Expect to make mistakes but be sure to reflect/learn from them!
- Are civil and are aware of your impact on others.
- Assume and engage with the strongest argument while assuming best intent.

1. Determine what the object to the right is topologically equivalent to.

2. Below are the steps for finding $\mathbb{T}^2 \# \mathbb{T}^2$ from page 71 of your text. Repeat the steps using a flat torus diagram instead.

3. Use flat torus diagrams to find $\mathbb{T} \# \mathbb{T} \# \mathbb{T}$.

4. Let $n\mathbb{T}^2$ denote an n holed torus. Draw a flat torus diagram for $n\mathbb{T}^2$.

5. Find $\mathbb{P}^2 \# \mathbb{P}^2$ using the flat projective plane diagram.

6. Find $\mathbb{P}^2 \# \mathbb{P}^2 \# \mathbb{P}^2$ using the flat projective plane diagram.

7. Let $n\mathbb{P}^2$ be the connect sum of n projective planes.
   Draw a flat projective plane diagram for $n\mathbb{P}^2$

8. Recall that $\mathbb{P}^2 \# \mathbb{P}^2$ is topologically equivalent to $\mathbb{K}^2$. Transform your answer in problem 5 into the standard flat $\mathbb{K}^2$ diagram.