

Homework 11

1. Show that $\mathbb{R}P^2 \# \mathbb{R}P^2 \# \mathbb{R}P^2$ is homeomorphic $(S^1 \times S^1) \# \mathbb{R}P^2$.
2. Identify the connect sum $S_g \# N_{g'}$ for $g, g' \geq 0$.
3. Let $m \geq 2$ be an integer. What surface is obtained by the labeling scheme:

$$a_1 a_2 \cdots a_m a_1^{-1} a_2^{-1} \cdots a_m^{-1}?$$

4. Let $m \geq 2$ be an even integer. What surface is obtained by the labeling scheme:

$$a_1 a_2 \cdots a_m a_1^{-1} a_2^{-1} \cdots a_{m-1}^{-1} a_m?$$

5. Let w be a proper labeling scheme for a 10-sided polygonal region P . Which orientable surfaces can be obtained by P/w ?