| MATH 5703 | Topology I | Fall 2014 |
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| Section: 001 | MWF 10:45 - 11:35 | Prof. Matthew Clay |
|  | MAIN 322 |  |

## Homework 11

1. Show that $\mathbb{R} \mathbb{P}^{2} \# \mathbb{R} \mathbb{P}^{2} \# \mathbb{R} \mathbb{P}^{2}$ is homeomorphic $\left(S^{1} \times S^{1}\right) \# \mathbb{R P}^{2}$.
2. Identify the connect sum $S_{g} \# N_{g^{\prime}}$ for $g, g^{\prime} \geq 0$.
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 $P / w$ ?
