1156-20-168 **Coy L. May** and **Jay Zimmerman*** (jzimmerman@towson.edu). *The Largest Group Actions on Riemann Surfaces of Genus g.*

A natural problem is to determine, for each value of the integer $g \geq 2$, the largest order of a group that acts on a Riemann surface of genus g. First, let $N(g)$ (respectively $M(g)$) be the largest order of a group of automorphisms of a Riemann surface of genus $g \geq 2$ preserving the orientation (respectively possibly reversing the orientation) of the surface.

The basic inequalities comparing $N(g)$ and $M(g)$ are $N(g) \leq M(g) \leq 2N(g)$. It is easy to see that the upper bound is satisfied for an infinite number of integers g. We also show that there are an infinite number of positive integers g, such that $N(g) = M(g)$.

Specifically, if p is a prime satisfying $p \equiv 1 \pmod 6$ and $g = 3p + 1$, there is a group of order $24(g - 1)$ that acts on a surface of genus g preserving the orientation of the surface. For all such values of $g = 3p + 1$ larger than a fixed constant, there are no groups with order larger than $24(g - 1)$ that act on a surface of genus g. (Received January 22, 2020)