

**MATH 351: RIEMANN SURFACES AND DESSINS D'ENFANTS
HOMEWORK #20**

Problem 20.1. Find the rational functions $f(z) \in \mathbb{C}(z)$ such that f has two double zeros, two double poles, and $f(z) - 1$ has two double zeros. [*Hint: Take the two double poles to be $0, \infty$ and the two double zeros to be at $a, -a$ for $a \in \mathbb{C}^\times$, so $f(z) = (z^2 - a^2)^2/z^2$.]*

Problem 20.2. Finish the labelling of the stereographic projection of the tetrahedral tessellation corresponding to $\Delta(2, 3, 3)$. Note any relations you observe in this labelling. How do you rotate around one of the other vertices not originally labelled a, b, c ? Do the same for the octahedral (and if you're feeling adventurous, the icosahedral) tessellations:

<http://www.cems.uvm.edu/~jvoight/351/Magnus.pdf>