

CHAPTER 4

Conclusion

This thesis gives the condition on m for the action of $\mathcal{H}(\sqrt{m})$ on $\sqrt{m}\widehat{\mathbb{Q}}$ to be transitive. We also identified the properties of its suborbital graph with those of the Hecke group $H(\sqrt{m})$ suborbital graph including the necessary and sufficient conditions for the existance of an edge between two vertices in $\mathcal{G}(\infty, \frac{u}{n}\sqrt{m})$ when $(m, n) = 1$ and $(m, n) = m$. After that, we represented the edges of the suborbital graphs with hyperbolic geodesics. As a result, we found that each edge of $\mathcal{G}(\infty, \sqrt{m})$ represented this way does not cross with another. We then gave the result involving $\mathcal{F}(\infty, (u/n)\sqrt{m})$, its edge condition and a similar lemma stating that none of its edges cross. Moreover, we investigated the circuits in these suborbital graphs and reached the conclusion that the suborbital graph $\mathcal{G}(\infty, (u/n)\sqrt{m})$ is a forest if and only if $n \nmid (mu^2 \pm mu + 1)$.

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