**Why did you choose these research fields? \***

Articulate why the research fields chosen on the previous page are intriguing and exciting to you. For each sub-field, state what you perceive as the one or two most interesting questions or problems in this area.  Explain why these sorts of questions interest you. Your responses are shared with mentors. Please respond with clarity and specificity, including what specific prior research/coursework/etc experiences have prepared you to "hit the ground running" in these fields at RSI.

**Math:**

I first became genuinely interested in math when I was in 8th grade. Because the math content in middle school was not challenging enough for me, I am thankful to my math teacher who helped me expand my math knowledge by recommending that I self-study high school math topics and sometimes provided me with interesting questions. These problems were usually related to the class content but required more advanced knowledge. After solving these problems, I felt a feeling of satisfaction rising from my deep mind, which built the base for further exploration in math.

I always consider math an interesting but challenging subject. Whenever I encounter difficulties or feel like giving up, the first thing that comes to my mind is, "Do I love math?" This question troubled me until the summer of 2023, which was the time I entered the Ross Mathematics Program. We are exploring gradually from the basis of number theory and abstract algebra and then dive deeply into every single proof of every lemma, proposition, theorem, and PODASIP (Prove Or Disprove And Salvage If Possible). We finally ended up the enjoyable journey at the proof of Quadratic Reciprocity, but after that I didn’t stop doing math, learning a variety of sub-fields by myself, including quadratic forms, elliptic curves, *p*-adic numbers, abstract algebra, etc. Solving theorems using previous knowledge is thrilling for me. Among the sub-fields, I am most interested in quadratic forms and abstract algebra. Quadratic forms, compared to other sub-fields, are less explored and I am eager to contribute in this field. I read Conway’s The Sensual (Quadratic) Form and am fascinated by the idea of using Conway’s Topograph to solve Pell’s Equation, can we extend the idea to solving Pell’s Equation for Gaussian integers? [1st research question] The other sub-field that I am interested in is abstract algebra.

**What are your long-range goals? \***

**What activities and/or hobbies demonstrate your leadership, creativity and uniqueness? \***

**Describe your participation in extracurricular or community outreach activities? \***