

- The final project will account for 25% of your course grade.
- Groups of two or three students will work on one of the final projects listed below. You may work with the same team you are working with on the lesson presentation.
- Deliverables consist of a complete written solution (target length: 5–10 pages) The paper does not need to be typeset if the handwriting is legible.
- The papers must be emailed to me by **Thursday, May 14 at 17:00**. PDF is preferable, but photos in JPG format will be accepted. I will deduct 10% of the team grade for every day (or portion thereof) the paper is late.
- The student group will be graded as a group. All group members must contribute to the project in equal parts. If members of a team feel that one member is not contributing in a meaningful way, they can ask me to remove the student from their group.
- Include references to all material sources you use.
- The group will be graded on the mathematical correctness, mathematical clarity, and completeness of their solution.
- Projects will be assigned to teams on **Tuesday, April 14**.

Projects:

(Numbers refer to end-of chapter projects.)

1. **Dulce, Elisabet, Hillary:** Nonary system - State and prove theorems for numbers in base 9 corresponding to the theorems in Section 2.1.3.
2. **Emi, Johnatan, Judith:** Countability of the set of algebraic numbers. (2.2)
3. [The field of algebraic numbers.](#)
4. **Brianna, Estefany:** [Quaternions.](#)
5. Stereographic projection. (2.8) (There is a typo in the formulas for x and y . The denominator should be $1 - t$ instead of $1 + t$.)
6. Limit definitions for the number e . (3.6) (There is a typo in Part c. It should be $b_p \geq \dots$, not $b_p = \dots$)
7. **Maria, Violeta:** The Cardano-Tartaglia method for solving cubic equations. Include a discussion of the *Casus Irreducibilis*. (2.5)
8. **Ashley, Berannia, Rebecca:** Ferrari's method to solve quartic equations. (4.4)
9. **Abigail, Jocelyne, Victoria:** Real and rational roots of polynomials with integer coefficients. (4.2) (A computer algebra system such as *Mathematica* may be helpful.)