

- The final project will account for 20% of your course grade.
- Student pairs will work on one of the final projects listed below. You may not work with the same person you are working with on the lesson presentation.
- Deliverables consist of a 15-minute presentation and a complete written solution (target length: five pages). The paper does not need to be typeset if the handwriting is legible.
- The projects will be presented during the final exam period on **Thursday, May 12 at 16:00 – 18:45**. All students must be present for all presentations.
- The accompanying papers are also due on **Thursday, May 12**, before the start of the presentations. Please email me your power point presentation after the presentations.
- 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 **Thursday, April 14**.

Projects:

(Numbers refer to end-of chapter projects.)

1. Nonary system - State and prove theorems for numbers in base 9 corresponding to the theorems in Section 2.1.3.
2. Countability of the set of algebraic numbers. (2.2)
3. [The field of algebraic numbers](#).
4. [Quaternions](#).
5. Coordinatization of the Riemann Sphere. (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. The Cardano-Tartaglia method for solving cubic equations. Include a discussion of the *Casus Irreducibilis*. (2.5)
8. [The geometry of the cubic formula](#). (RWD Nickalls) [No written report; somewhat dependent on 7.]
9. $\sin 1^\circ$. (Travis Kowalski) [No written report; somewhat dependent on 7.]