- From Section 17:

    1. Please solve Exercises 17.10 and 17.18 from the textbook.

- From Section 18:

    1. Please solve Exercise 18.19 from the textbook (you do not need to generalize to more than two summands).

    2. Prove that a homomorphism from a field onto a ring with more than one element must be an isomorphism.

- From the presentations on Tuesday, November 22:

    1. Find a group G such that $P_2(G) = 5/8$.

    2. Give an example of a field (that wasn't discussed in the presentation!) and extend it so that the extension is an algebraically closed field.

- From the presentations on Tuesday, November 29:

    1. (a) You are a horror movie director and want to rotate a zombie's head 278 degrees counterclockwise around to thoroughly scare your audience. Please find the special orthogonal matrix to do this.

       (b) The next zombie can't look exactly the same! Let's make his head go 48 degrees backwards (ie, chin lifting towards ceiling). What special orthogonal matrix would accomplish this?

       (c) Now it's time to bring the intensity. We want the third zombie's head to rotate 278 degrees counterclockwise and THEN 48 degrees backwards. Please find this special orthogonal matrix.

    2. Please prove that $SE(3)$ is noncommutative.

- EXTRA CREDIT

    1. (from Kevin, Ray, and Steven) Show that the maximum size of the center of a non-abelian finite group is $|G|/4$.
       (Hint: Consider centralizers and Lagrange's Theorem.)

    2. Let $\mathbb{Z}[i] = \{a + bi : a, b \in \mathbb{Z}\}$. Show that the field of quotients of $\mathbb{Z}[i]$ is isomorphic to $\mathbb{Q}[i] = \{p + qi : p, q \in \mathbb{Q}\}$.