Problem Set 1
Due: Thursday, January 19

Work all of the following problems. A subset of the problems will be graded. Be sure to adhere to the expectations outlined in the *General Problem Set Guidelines Sheet*.

Unless otherwise stated, all problems can be found in the appropriate *Exercises* sections of the text (*Abstract Algebra* by D. Dummit and R. Foote, 3rd Edition).

- Section 1.1 # 6 part (f), 11, 22, 25
- Section 1.2 # 4
- Section 1.3 # 1, 9 part (b), 14, 17
- Fix n to be a positive integer and let

  $$SL_n(\mathbb{R}) := \{n \times n \text{ matrices } A \text{ with entries in } \mathbb{R} \mid \det(A) = 1\}.$$

  Show that $SL_n(\mathbb{R})$ is a group under the binary operation of matrix multiplication. Is this group abelian?