Homework 1
Due Wednesday, May 27

1. Chapter 3, Exercise A1 (p. 29)
2. Chapter 3, Exercise A3 (p. 29)
3. Chapter 3, Exercise B1 (p. 30)
4. Chapter 3, Exercise D (p. 31)
5. Chapter 3, Exercise E (p. 32)
6. Show that a set G with an operation $x * y = x + y + xy$ on $\{x \in \mathbb{Z} : x \neq -1\}$ is NOT a group.
7. Suppose that G is a set of all *nonsingular* (invertible) 2×2 matrices (with real number entries). Argue that G is a group under the matrix multiplication operation. Is it Abelian?
8. Suppose that G is a set of nonsingular 2×2 real matrices $\begin{bmatrix} a & b \\ c & d \end{bmatrix}$ with the additional property that each column sums to 1 (i.e., $a + c = 1$ and $b + d = 1$). Show that G is a group under the matrix multiplication.