Algebra 1
HW 4 (Due: 14-09-2023)

1. Solve Exercise27,Section10.3,Dummit and Foote(This says free modules over non-commutative rings need not have unique rank)
2. Exercises 2, 5, 6 Section 10.4, Dummit and Foote
3. Show that the $\mathbb{Z}$-module $\mathbb{Q}$ is not projective but is flat
4. Show that any R-module is contained in an injective R-module
5. Show that given a ring R, the statement that every R-module is projective is equivalent to the statement that every R-module is injective
6. Exercise 10,11 Section 10.5, Dummit and Foote
7. Exercise 21, 23 Section 10.5, Dummit and Foote
8. (Optional Bonus problem + 10 points): Exercise 26, Section 10.5, Dummit and Foote