

Math 2102: Homework 1

Due on: Jan. 22, 2024

We will grade only **three** exercises from the Homework, but you should turn in **all of them**. The section numbers always refer to Axler's Linear Algebra Done Right (**4th edition**), unless otherwise noted.

- 1) Exercise 6 from §1B.
- 2) Let $U_1, U_2 \subseteq V$ be two subspaces. Prove that $U_1 \cup U_2$ is a subspace if and only if $U_1 \subseteq U_2$ or $U_2 \subseteq U_1$.
- 3) Assume that \mathbb{F} has not characteristic 2. Prove that the union of three subspaces is a subspace if and only if one of them contains the other two.
- 4) Exercises 16, 17 and 18 from §1C.
- 5) Prove or give a counterexample: suppose that $V + U_1 = V + U_2$ then $U_1 = U_2$.
- 6) Exercise 24 from §1C.
- 7) Exercise 3 from §2A.
- 8) Exercise 7 from §2A.
- 9) Exercises 15 and 16 from §2A.