

Physics 263: BTM Problem Set #17

One more round of problems from BTM Chapter 8, “Matrices and Determinants,” covering Pauli matrices in detail. Please ask questions! The problems are due by 5:30pm in the box in 1011 on Friday, May 26.

1. **BTM Problem 8.4.16.** Basic properties of the renowned Pauli matrices, such as their commutators.
2. **BTM Problems 8.4.17 and 8.4.18.** Here we show an identity in which the three Pauli matrices form the components of a vector and then another you will use in quantum mechanics that uses the first identity and involves the exponential of the Pauli matrices.
3. **BTM Problem 8.4.19.** Basic properties of matrix traces (the sum of the diagonal elements).
4. **BTM Problems 9.1.1.** Checking the axioms of a linear vector space for some matrix examples.
5. **BTM Problems 9.1.2.** Checking the axioms of a linear vector space for some function examples.
6. **BONUS: BTM Problem 9.1.3.** Proofs of some basic properties that hold for linear vector spaces.