

Physics 263: BTM Problem Set #16

These are more problems are from BTM Chapter 8, “Matrices and Determinants,” covering determinants, transformations, and special matrices. Please ask questions! The problems are due by 5:30pm in the box in 1011 on Tuesday, May 23.

1. **BTM Problem 8.3.1.** This may be a bit tedious, but it is intended to establish through the simplest example (2×2 matrices) the basic properties of determinants.
2. **BTM Problem 8.3.4.** One of the basic applications of matrices, solving simultaneous equations, applied to 3×3 systems.
3. **BTM Problems 8.4.2 and 8.4.3.** Hermitian matrices are an essential part of quantum mechanics. Here you demonstrate some basic properties.
4. **BTM Problem 8.4.5.** The other important type of matrix for quantum mechanics are unitary matrices.
5. **BONUS: BTM Problem 8.4.9.** This is an important formula and it involves Taylor expansions!
6. **BONUS: BTM Problem 8.4.10.** An important relation for quantum mechanics. Worth doing!