Homework Set 1, Physics 355, Spring 2024. Handed out Jan. 22, due Jan. 29 in class. Please turn in a legible paper copy, with your full name on the paper. A complete solution should be submitted for each problem, with no missing steps. This homework is based on the in-class lectures for Chapter 4 in the text. The problems are taken from the text, with one exception, and the text is the best reference for the equations needed.

(1) Problem 3. (Time differences this small are easy to measure with modern clocks, and experiments like this with airliners have actually been done, to check time dilation at speeds tiny compared to light.)

(2) Problem 13.

(3) Problem 17.

(4) Problem 21.

(5) A certain particle has a mass of 940 MeV in energy units. It is composed of particles with a total mass of 3 MeV. What is (a) the total internal energy of the system, and (b) the sum of the internal kinetic and potential energies of the system?