

Winter Quarter 2018 – UCSB Physics 24
Homework 3
Due Friday, February 9, 5 pm

• **Problem 1**

The Large Hadron Collider (LHC) at CERN accelerates beams of protons to an energy of 4 TeV. What is the speed of these protons. Express your answer in terms of v/c . Note: the rest energy of a proton is $m_0c^2 = 938$ MeV. (I wrote this problem some years ago. The energy is now 6.5 TeV).

• **Problem 2**

K&K 13.2.

• **Problem 3**

K&K 13.4

• **Problem 4**

K&K 13.8 (1st edition) or 13.9 (2nd edition); do part (a) only.

• **Problem 5**

K&K 14.1; my answer is $\theta = 42^\circ$, but in my edition of the book the answer is $\theta = 51^\circ$. It looks like this was fixed in the 2nd edition.

• **Problem 6**

K&K 14.2; my answer is 145 MeV, but in my edition of the book the answer is 154 MeV. It looks like this was also fixed in the 2nd edition.