Homework Sets

Physics 304

Homework 1

- Hardy Problems 1.1 to 1.5

Homework 2

- Hardy Problems 2.1 to 2.4

Homework 3

- Hardy Problems 3.1 to 3.6

Homework 4

- Problem A: In Hardy section 4.2, we learn that the temperature of air decreases with altitude at the rate of about 9.7°C/km.

  (a) If this continues to be true as altitude increases, estimate the altitude at which the temperature dips below absolute zero.

  (b) Make a graph showing the straight-line decrease of temperature with altitude, and show where the temperature would pass absolute zero. Now the temperature cannot drop below absolute zero, so this straight-line dropping of temperature with altitude cannot be quite right. On the same graph, sketch what you think would be a more reasonable behavior for temperature as a function of altitude.

(c) Can you use section 4.2 to obtain a function for temperature as a function of altitude? If so, please do it. If not, give what evidence you can for why the temperature-altitude curve should look the way it does.

- Hardy Problems 4.2, 4.5, 4.6

Homework 5

- Hardy Problems 5.1 to 5.4

Homework 6

- Hardy Problems 6.1, 6.2, 6.4, 6.5

Homework 7

- Hardy Problems 7.1, 7.3, 7.6, 7.7

Homework 8

- Problem A: (This could have been on Homework 6, but I just thought of it.) Find an expression for the Joule-Thompson (or is it Joule-Thomson?) coefficient for a van der Waals gas with $a = 0$ in terms of the van der Waals parameter b.

- Hardy Problems 8.1, 8.2, 8.3

Homework 9

- Hardy Problems 9.2, 9.3, 9.5, 9.6

Homework 10

- Hardy Problems 10.2, 10.3, 10.4, 10.5

Homework 11

- Hardy Problems 11.1, 11.2, 11.3, 11.5

Homework 12

- Hardy Problems 12.2, 12.3

Homework 13

- Hardy Problems 15.1, 15.2, 15.4