Homework Four

Thermodynamics

College of the Atlantic

Due Friday, April 23, 2021

There is one part to this assignment.

Part 1: Problems from the Textbook. Here are some instructions for how to submit this part of the assignment.

- Do the problems by hand using pencil (or pen) and paper. There is no need to type up this assignment.
- Make a pdf scan of your work using genius scan or some similar scanning app. Please make the homework into a single pdf, not multiple pdfs.
- Submit the assignment on google classroom. Please don't email it to me.
- If you want to do one or more of these problems one or two other people and hand in only one write-up, go for it.

1. 2.2
2. 2.5 (a, b, and c)
3. 2.7
4. 2.8
5. Deriving a useful approximation.

   (a) Derive the approximation

   $$\ln(1+x) \approx x \,, \tag{1}$$

   which is valid for $|x| \ll 1$. To do so, figure out the equation of the line tangent to $\ln(1+x)$ at $x = 0$.

   (b) Check the accuracy of the approximation in Eq. (1) for $x = 0.1$, $x = 0.01$, and $x = 0.001$.

6. 2.16