1. Consider a heat engine cycle consisting of:

   Step 1: Isothermal expansion at temperature $T_h$.
   Step 2: Removing heat at constant volume until the temperature reaches $T_C$.
   Step 3: Isothermal compression at $T_C$.
   Step 4: Heating the gas at constant volume until the temperature returns to $T_h$ and the cycle renews.

   (The PV diagram for this process should be equivalent to the process described in question 1 of the first hour exam).

   Find the efficiency of this heat engine, and compare its efficiency explicitly to the efficiency of a Carnot engine operating between these two temperatures. Show explicitly that the efficiency of this engine is less than a Carnot engine’s.

2. Why are air conditioning units placed in windows and not the middle of a room?


4. Problem 3.31

5. Problem 5.8