PHYS 328 HOMEWORK #8

Due : 1 Nov. 2012

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?

- 3. Problem 4.1.
- 4. Problem 3.31
- 5. Problem 5.8