

Compression Work

Thermodynamics

Winter 2025

College of the Atlantic.

1. Which of the following processes are heat and which are work?
 - (a) Warming up your hands by rubbing them together
 - (b) Heating up water in a microwave.
 - (c) Heating up water on an electric stove.
 - (d) Heating up water on a gas stove.
 - (e) Ice melts in warm water.
 - (f) Energy flows from the sun to the earth
2. Consider the three-step cycle for an ideal gas shown in the Figure.
 - (a) Describe physically what is happening at each step of the cycle
 - (b) For each step in the cycle, determine:
 - i. W , the work done on the gas.
 - ii. ΔU , the sign of the change in the internal energy of the gas. (I.e., is it positive or negative.)
 - iii. Q , the sign of heat added to the gas
 - (c) What is the sign of each of these quantities for the entire cycle?

