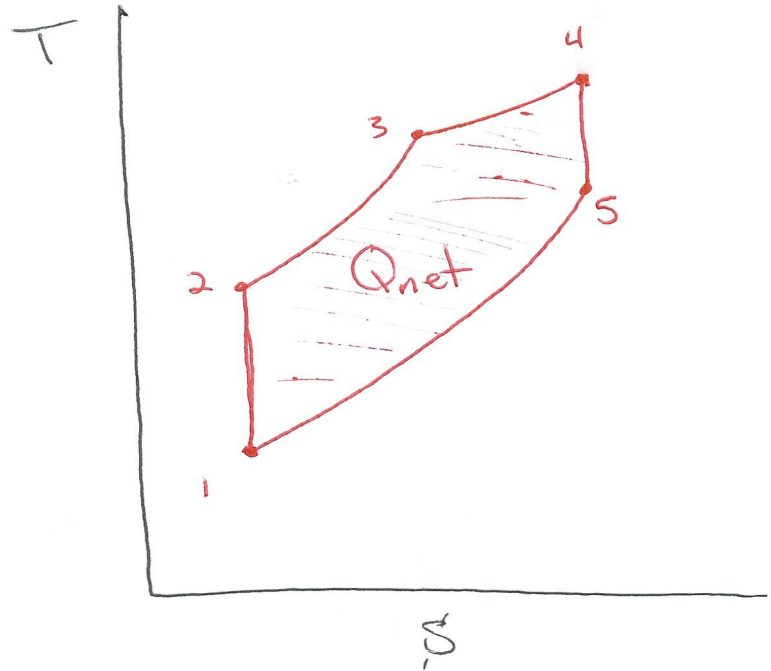
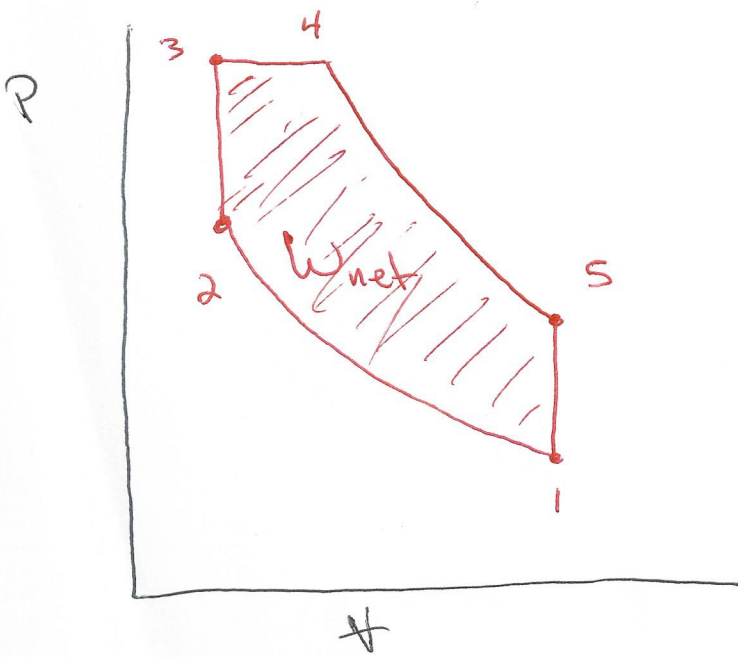


CYCLE ANALYSIS ACTIVITY

Names key

In this activity you will visualize a thermodynamic cycle on a PV and TS diagram and relate process paths to work transfer, heat transfer, and changes in internal energy (with particular emphasis on the sign of each quantity associated with each process as well as the overall cycle).

a) Sketch the following processes that make up a thermodynamic cycle, using data in the table below. Show pressure-volume (P-V) and temperature-entropy (T-S) diagrams. Clearly label the starting and ending points for each process. Assume ideal gas behavior.



b) Provide the sign (+, -, or zero) for work, heat, and change in internal energy for each process.

Process	Work	Heat	ΔU
1-2 isentropic compression	-	0	+
2-3 isochoric heat addition	0	+	+
3-4 isobaric heat addition	+	+	+
4-5 reversible, adiabatic expansion	+	0	-
5-1 isochoric heat rejection	0	-	-
ENTIRE CYCLE (1-2-3-4-5-1)	+	+	0

$$W = \int P dV \quad Q = \int T dS \quad \Delta U = Q - W = \int nC_V dT$$