An ideal gas begins at initial conditions V_0, p_0 and T_0.

1. We first allow the gas to expand to twice its original volume at fixed temperature.

2. We then cool it at fixed pressure until it returns to its original volume.

3. Finally, we heat it up at fixed volume until it returns to the original pressure and temperature.

You may use the following two properties of a monatomic ideal gas:

$$U = \frac{3}{2}Nk_BT \tag{1}$$

$$pV = Nk_BT \tag{2}$$

- Solve for the energy transfered by working, and energy transfered by heating, on each process in the cycle.

- Find the internal energy of the gas after each process in the cycle.

- Find the net energy transfered by working and heating over the entire cycle.

Solution   FIXME

1. We first allow the gas to expand to twice its original volume at fixed temperature.

2. We then cool it at fixed pressure until it returns to its original volume.

3. Finally, we heat it up at fixed volume until it returns to the original pressure and temperature.