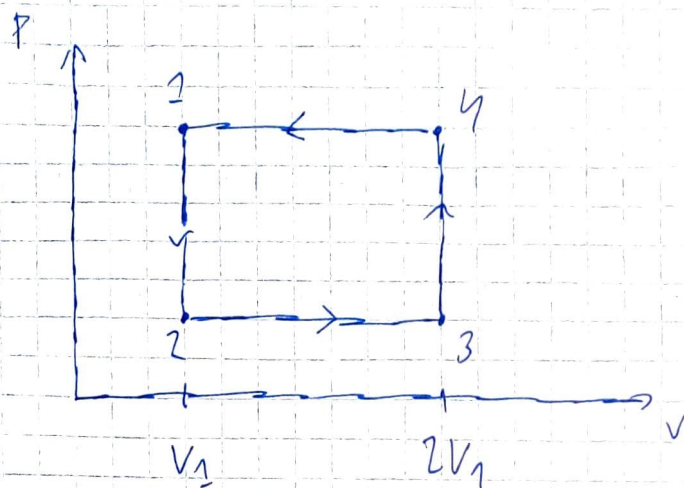


N 1.39

$$T_4 = T_{\max} = 600 \text{ K}$$

$$T_2 = T_{\min} = 200 \text{ K}$$

$i=3$



Применяем ко всем процессам I начало термодинамики

$$Q_{12} = \frac{i}{2} R (T_2 - T_1) < 0 \quad \text{для изобарных процессов:}$$

$$Q_{23} = \frac{i}{2} R (T_3 - T_2) + p_2 (V_1) > 0 \quad \frac{V_1}{2V_1} = \frac{T_1}{T_4} \Rightarrow T_1 = T_4 \cdot \frac{1}{2}$$

$$Q_{34} = \frac{i}{2} R (T_4 - T_3) > 0 \quad \frac{2V_1}{V_1} = \frac{T_3}{T_2} \Rightarrow T_3 = T_2 \cdot 2$$

$$Q_{41} = \frac{i}{2} R (T_1 - T_4) + p_1 (-V_1) < 0 \quad T_1 = 300 \text{ K} \quad T_3 = 400 \text{ K}$$

$$\eta = \frac{|Q_+|}{|A|} = \frac{|Q_+|}{|A|}$$

$$Q_+ = \frac{i}{2} R (T_4 - T_3 + T_3 - T_2) + p_2 (V_1) = \frac{i}{2} R (T_4 - T_2) + R T_2$$

$$A = p_2 V_1 - p_1 (V_1) = R T_2 - R T_1 = R (T_2 - T_1)$$

$$|A| = R (T_1 - T_2)$$

$$\eta = \frac{R \left(\frac{i}{2} (T_4 - T_2) + T_2 \right)}{R (T_1 - T_2)} = \frac{\frac{i}{2} (T_4 - T_2) + T_2}{T_1 - T_2} = \frac{\frac{3}{2} (600 \text{ K} - 200 \text{ K}) + 200 \text{ K}}{300 \text{ K} - 200 \text{ K}}$$

$$\eta = 3$$