



$$100 \text{ kPa} = 100 \cdot 10^3 \text{ Pa}$$

$$100 \text{ m} = 0,1 \text{ m}^3$$

$$V_2 = \frac{V_1}{5}$$

$$V_3 = \frac{4}{5} V_1$$

$$p_4 = 3p_1$$

$$3p_1 - 5p_1 = -2p_1$$

$$-1,61$$

Dato:

$$p_1 = 100 \text{ kPa}$$

$$V_1 = 100 \text{ m}$$

Q - ?

Processe:

$$1 \rightarrow 2: \frac{p_2}{p_1} = \frac{V_1}{V_2} = \frac{5V_1}{V_1} = 5$$

$$2 \rightarrow 3: \frac{V_3}{V_2} = \frac{T_3}{T_2}; \frac{4V_1}{V_1} = \frac{T_3}{T_2} = 4$$

$$3 \rightarrow 4: \frac{p_4}{p_3} = \frac{T_4}{T_3}; \frac{3p_1}{5p_1} = \frac{T_4}{4T_1} \Rightarrow T_4 = \frac{12T_1}{5}$$

$$Q = Q_1 + Q_2 + Q_3 = A_{12} + A_{23} + A_{23} + A_{34} =$$

$$= p_1 V_1 \ln \frac{V_3}{V_1} + p_2 (V_3 - V_2) + \frac{5}{2} p_2 (V_3 - V_2) + \frac{5}{2} (p_4 - p_3) V_3 =$$

$$= p_1 V_1 \ln \frac{1}{5} + 5p_1 \cdot \frac{3V_1}{5} + \frac{5}{2} \cdot 5p_1 \cdot \frac{3V_1}{5} + \frac{5}{2} \cdot \frac{4}{5} V_1 \cdot (-2p_1) =$$

$$= p_1 V_1 \left(\ln \frac{1}{5} + 3 + \frac{15}{2} - 4 \right) = p_1 V_1 \cdot 4,89 = 4,89 \cdot 0,1 \cdot 100 \cdot 10^3 =$$

$$= 48,9 \text{ (kJ)}.$$

Omber: 48,9 kJ.