W2-4-2 Ideal gas 2

Consider an ideal gas with a temperature of $T_1 = 300$ K and a specific volume of $v_1 = 0.86$ m^3/kg. As a result of a disruption, the state of the gas changes to $T_2 = 302$ K and $v_2 = 0.87$ m^3/kg ($R = 0.287$ kJ/kgK).

What would the pressure change be if the temperature would have been constant?

If the temperature would have remained constant, then $\dot{T} = 0$ and it follows that

$$\dot{P} = \left(\frac{\partial P}{\partial v}\right)_T \dot{v} = -\left(\frac{RT}{v^2}\right)\dot{v} = -1.155 \text{ kPa}$$

The pressure then reduces with 1.155 kPa.