

[tex38] Internal energy and entropy of van der Waals gas

Calculate the internal energy $U(T, V)$ and the entropy $S(T, V)$ of the van der Waals gas, specified by the equation of state

$$\left(p + \frac{aN^2}{V^2}\right)(V - Nb) = Nk_B T$$

and the specific heat $C_V = \alpha Nk_B$.

Solution: