

### [tex17] Chemical potential of the classical ideal gas

Calculate the chemical potential  $\mu(T, p)$  of the classical ideal gas by integrating the Gibbs-Duhem equation,  $SdT - Vdp + Nd\mu = 0$ , with  $V(T, p)$  from the equation of state and  $S(T, p)$  from [tex14]. Compare the result with the Gibbs free energy per particle,  $G/N = \mu$ , calculated in [tex15].

**Solution:**