

49. 熱力学

(3)

$$PV^{\frac{5}{3}} = \frac{nRT}{V} \cdot V^{\frac{5}{3}} = nRTV^{\frac{2}{3}}, \quad PV^{\frac{5}{3}} = \text{一定}, \quad nR = \text{一定より},$$

$$TV^{\frac{2}{3}} = \text{一定} \quad \text{の関係が成り立つから},$$

$$T_3(SL)^{\frac{2}{3}} = T_2 \left(S \cdot \frac{3}{2} L \right)^{\frac{2}{3}} \quad \therefore T_3 = \left(\frac{3}{2} \right)^{\frac{2}{3}} T_2$$

$$\text{これと } T_2 = \frac{3}{2} \left(T_0 + \frac{MgL}{nR} \right) \text{ より, } T_3 = \left(\frac{3}{2} \right)^{\frac{5}{3}} \left(T_0 + \frac{MgL}{nR} \right) \quad \dots \text{(答)}$$