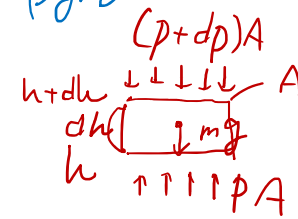
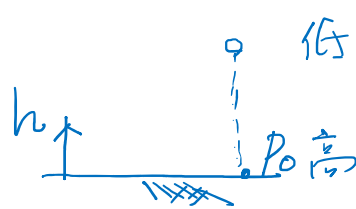
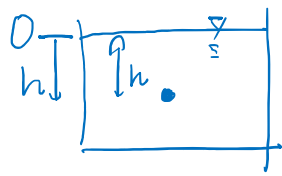


技術系専門試験問題演習講座 一般職 機械

2019年 国家一般職 機械職 No.36
(熱力学)

(1) $p = \rho gh$



∫, ∫.

$$p = p_0 - \rho gh \Rightarrow dp = -\rho g dh \rightarrow \textcircled{1} -\rho g$$

$$pA + Adp + mg = pA$$

$$m = \rho V = \rho A dh$$

$$\therefore dp + \rho g dh = 0$$

$$p T^{-\frac{\kappa}{\kappa-1}} = \text{Const}$$

$$d\left(p T^{-\frac{\kappa}{\kappa-1}}\right) = dp \times T^{-\frac{\kappa}{\kappa-1}} - \frac{\kappa}{\kappa-1} p T^{-\frac{\kappa}{\kappa-1}-1} dT = 0$$

$$\therefore dp - \frac{\kappa}{\kappa-1} p T^{-1} dT = 0$$

状态 Eq.

$$pV = mRT \Rightarrow p = \left(\frac{m}{V}\right) RT \rightarrow p = \rho RT$$

$$\textcircled{2} dp = -\rho g dh$$

$$-\rho g dh - \frac{\kappa}{\kappa-1} \rho R dT = 0$$

$$\frac{dT}{dh} = -\frac{\kappa-1}{\kappa} \cdot \frac{g}{R} \textcircled{3}$$

→ 分支