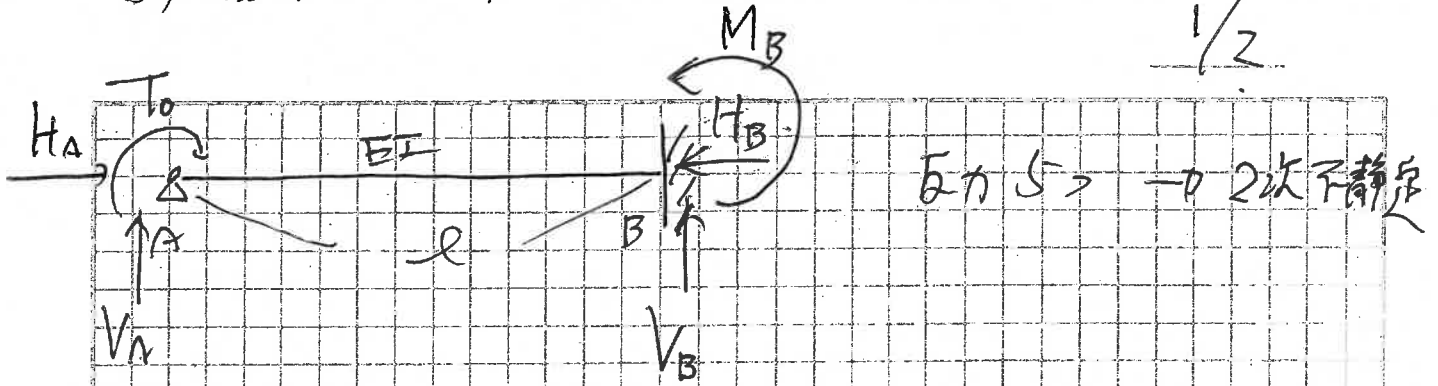


Q) 曲げモーメント図を作成せよ

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① 柱端モーメント式

$$\left. \begin{aligned} M_{AB} &= \frac{2EI}{l} (2\theta_A + \theta_B - 3R) + C_{AB} \\ M_{BA} &= \frac{2EI}{l} (\theta_A + 2\theta_B - 3R) + C_{BA} \end{aligned} \right\}$$

A点 B点の支点移動なし $R=0, \therefore \theta_B=0$

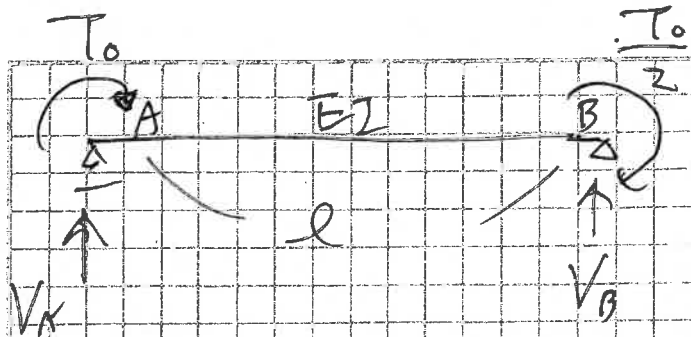
A-B間に荷重なし $C_{AB}=C_{BA}=0$

$$\therefore \left(\begin{aligned} M_{AB} &= \frac{2EI}{l} (2\theta_A + 0) = \frac{4EI}{l} \theta_A \\ M_{BA} &= \frac{2EI}{l} (\theta_A + 0) = \frac{2EI}{l} \theta_A \end{aligned} \right)$$

② 節点方程式

$$M_{AB} = T_o = \frac{4EI}{l} \theta_A \quad \therefore \theta_A = \frac{T_o l}{4EI} //$$

$$\left(\begin{aligned} M_A = M_{AB} &= \frac{4EI}{l} \times \frac{T_o l}{4EI} = T_o \\ M_B = -M_{BA} &= \frac{-2EI}{l} \times \frac{T_o l}{4EI} = -\frac{T_o}{2} \end{aligned} \right)$$

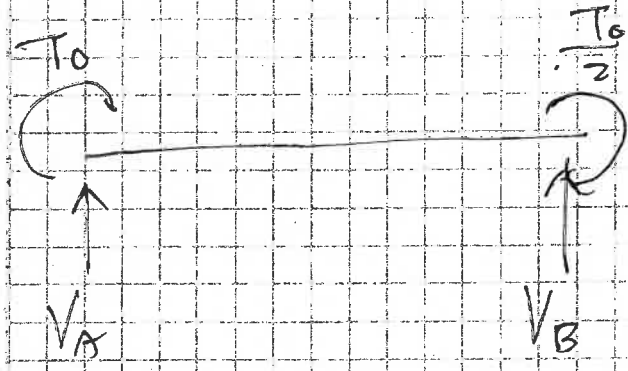


$$\begin{cases} \sum H = H_A = H_B = 0 \\ \sum V = V_A + V_B = 0 \\ \sum M_A = T_0 - V_B l + \frac{T_0}{2} = 0 \end{cases}$$

$$\begin{cases} V_B = \frac{3T_0}{2l} \\ V_A = -\frac{3T_0}{2l} \end{cases}$$

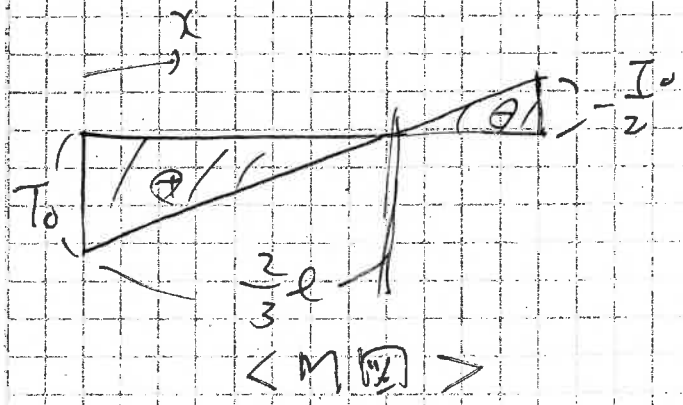


$M_x =$



$$\begin{cases} \sum V = V_A + V_B = 0 \\ \sum M_A = T_0 + \frac{T_0}{2} - V_B l = 0 \end{cases}$$

$$\begin{aligned} V_B &= \frac{1}{l} \times \frac{3}{2} T_0 \\ &= \frac{3T_0}{2l} \\ V_A &= -\frac{3T_0}{2l} \end{aligned}$$



$$M_x = T_0 - \frac{3}{2l} T_0 x = 0$$

$$x = \frac{2l}{3T_0} \times T_0 = \frac{2}{3} l$$

$$\begin{aligned} M_x &= T_0 + V_A x \\ &= T_0 - \frac{3}{2l} T_0 x \end{aligned}$$

$x=0, M_x = T_0$

$x=l, M_x = T_0 - \frac{3}{2} T_0 = -\frac{1}{2} T_0$