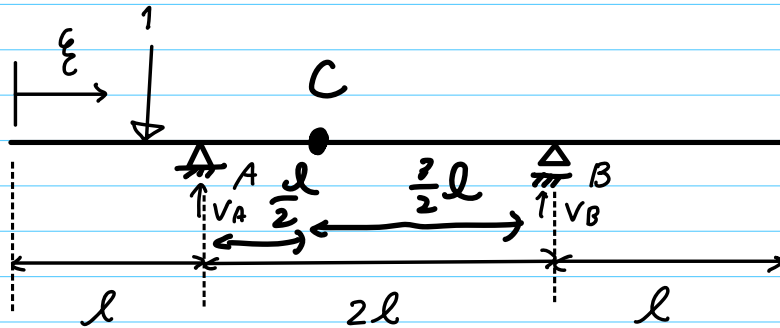


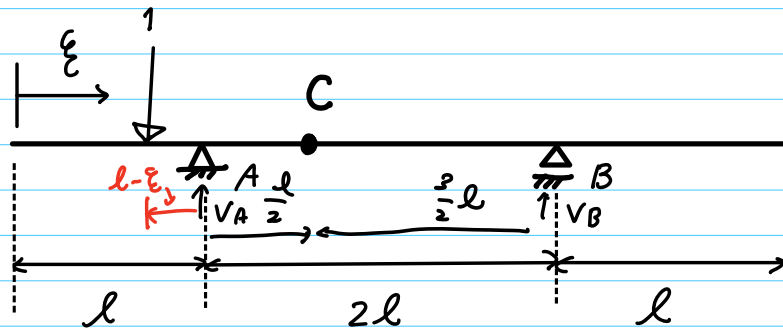
小テスト第13回 解答



第12回の解答から V_A と V_B を利用

場合分けあり

1) $0 \leq \xi \leq \frac{3}{2}l$ (荷重が着目点より左にある場合)



$$\uparrow \Sigma: V_A + V_B - 1 = 0$$

$$\downarrow M_A: V_B + 2l + 1 \cdot (l - \xi) = 0$$

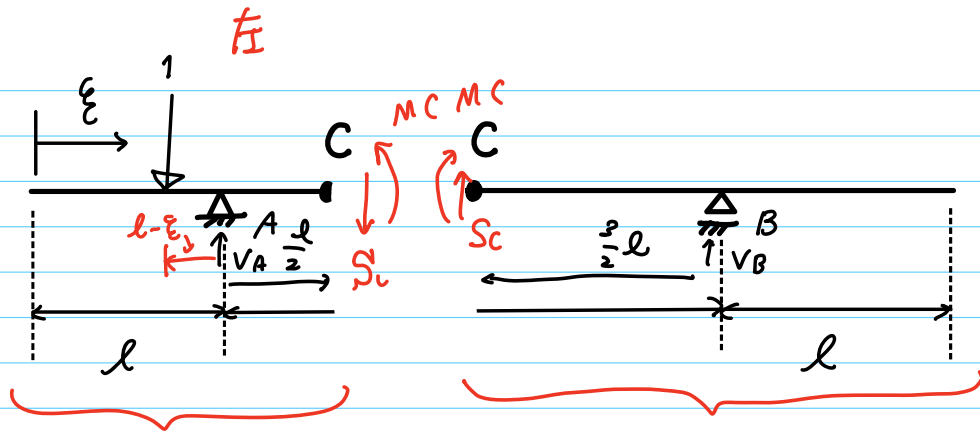
$$V_B 2l = -(l - \xi)$$

$$V_B = \frac{\xi - l}{2l}$$

$$V_A = 1 - V_B$$
$$= 1 - \frac{\xi - l}{2l}$$

$$= \frac{2l - \xi + l}{2l}$$

$$= \frac{3l - \xi}{2l}$$



$$\uparrow \Sigma: -1 + V_A - S_c = 0$$

$$\uparrow \Sigma: S_c + V_B = 0$$

$$S_c = -1 + V_A$$

$$= -1 + \frac{3l - \xi}{2l}$$

$$= \frac{-2l + 3l - \xi}{2l}$$

$$= \frac{l - \xi}{2l}$$

$$S_c = -V_B = -\frac{\xi - l}{2l}$$

$$= \frac{l - \xi}{2l}$$

同じ! なお? 片側が1+? OK!

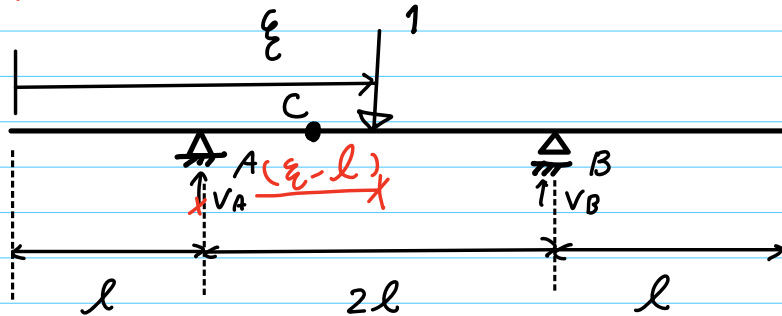
$$\downarrow M_c: -M_c + V_B \cdot \frac{3}{2}l = 0$$

$$M_c = V_B \cdot \frac{3}{2}l$$

$$= \frac{\xi - l}{2l} \cdot \frac{3}{2}l$$

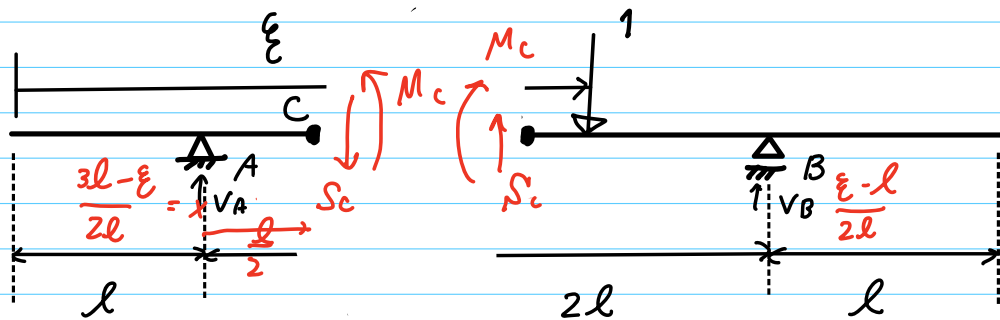
$$= \frac{3(\xi - l)}{4}$$

2) $\frac{3}{2}l \leq \xi \leq 4l$ (荷重が着目点より右にある場合)



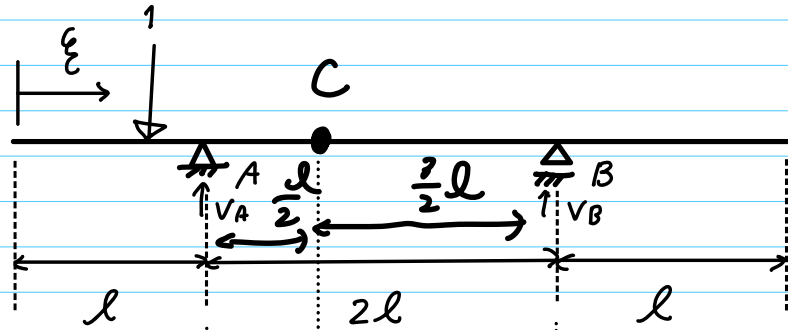
$$\begin{aligned} \uparrow \Sigma: V_A - 1 + V_B &= 0 & V_A &= 1 - V_B \\ \downarrow M_A: -1 \cdot (\xi - l) + V_B \cdot 2l &= 0 & &= 1 - \frac{\xi - l}{2l} \\ & & &= \frac{2l - \xi + l}{2l} \\ & & &= \frac{3l - \xi}{2l} \end{aligned}$$

$$\begin{aligned} 2lV_B &= (\xi - l) \\ V_B &= \frac{\xi - l}{2l} \end{aligned}$$

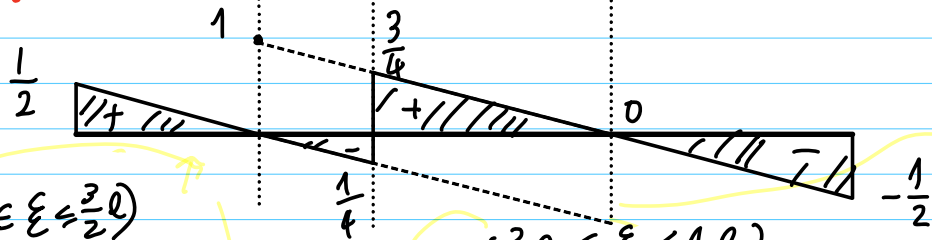


$$\begin{aligned} \uparrow \Sigma: V_A - S_c &= 0 & \downarrow M: -\frac{l}{2} \cdot \frac{3l - \xi}{2l} + M_c &= 0 \\ S_c &= \frac{V_A}{2} = \frac{3l - \xi}{2} & M_c &= \frac{(3l - \xi)l}{4} \end{aligned}$$

影響線



S_c -line



$$(0 \leq \xi \leq \frac{3}{2}l)$$

$$S_c = \frac{l - \xi}{2l}$$

$$\xi = 0 \quad S_c = \frac{l}{2l} = \frac{1}{2}$$

$$\xi = l \quad S_c = 0$$

$$\begin{aligned} \xi = \frac{3}{2}l \quad S_c &= \frac{l - \frac{3}{2}l}{\frac{2l - 3l}{2}} \\ &= \frac{-\frac{1}{2}l}{-\frac{l}{2}} \\ &= \frac{1}{2} \end{aligned}$$

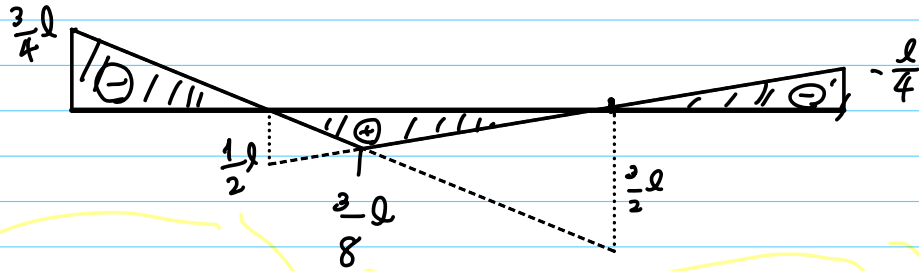
$$(\frac{3}{2}l \leq \xi \leq 4l)$$

$$S_c = \frac{3l - \xi}{2l}$$

$$\xi = \frac{3}{2}l \quad S_c = \frac{3l - \frac{3}{2}l}{2l} = \frac{3}{4}$$

$$\xi = 4l \quad S_c = \frac{3l - 4l}{2l} = -\frac{1}{2}$$

M_c -line



$$M_c = \frac{3(\xi - l)}{4}$$

$$\xi = 0 \quad M_c = -\frac{3l}{4}$$

$$\xi = l \quad M_c = 0$$

$$\xi = \frac{3}{2}l \quad M_c = \frac{3\left(\frac{3}{2}l - l\right)}{4}$$

$$= \frac{3 \cdot \frac{l}{2}}{4}$$

$$= \frac{3}{8}l$$

$$M_c = \frac{3l - \xi}{4}$$

$$\xi = \frac{3l}{2} \quad M_c = \frac{3l - \frac{3l}{2}}{4} = \frac{3l}{8}$$

$$\xi = 4l \quad M_c = \frac{3l - 4l}{4} = -\frac{l}{4}$$