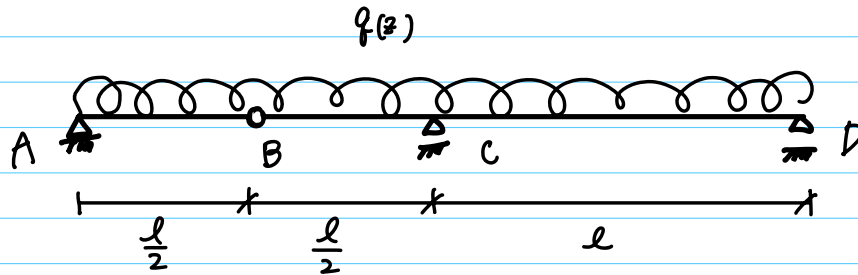
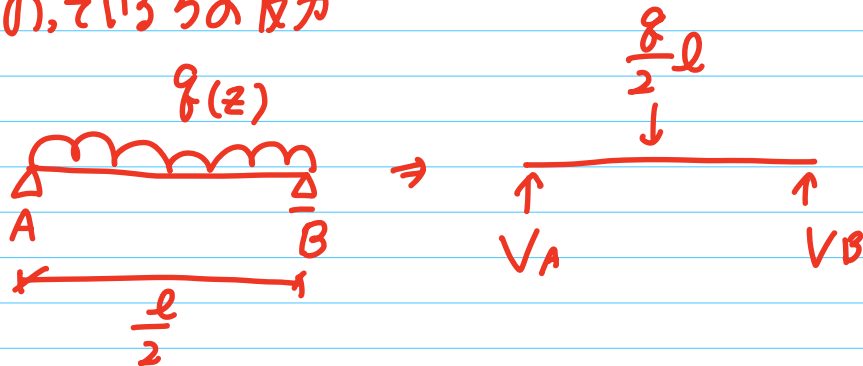


# 第10回 小テスト 6/23) Solutions



0,713 ちの反力



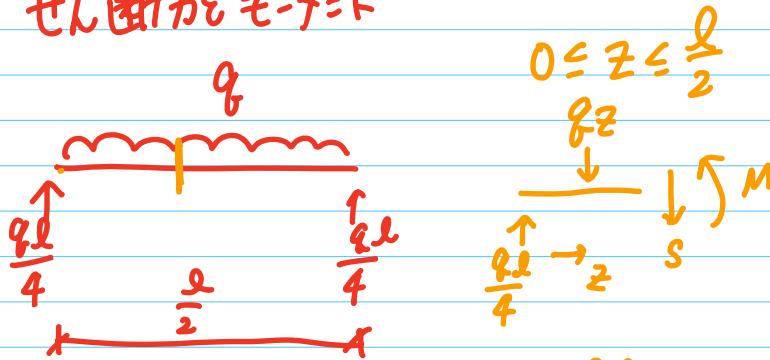
$$\downarrow \sum M_{V_A} = -\frac{q}{2} \cdot \frac{l}{4} + V_B \cdot \frac{l}{2} = 0$$

$$V_B = \frac{2}{l} \cdot \frac{ql^2}{84} = \frac{2l}{4}$$

$$\downarrow \sum F_y = -V_A - V_B + \frac{q}{2}l = 0$$

$$V_A = \frac{2l}{2} - \frac{2l}{4} = \frac{2l}{4}$$

せん断力とモーメント



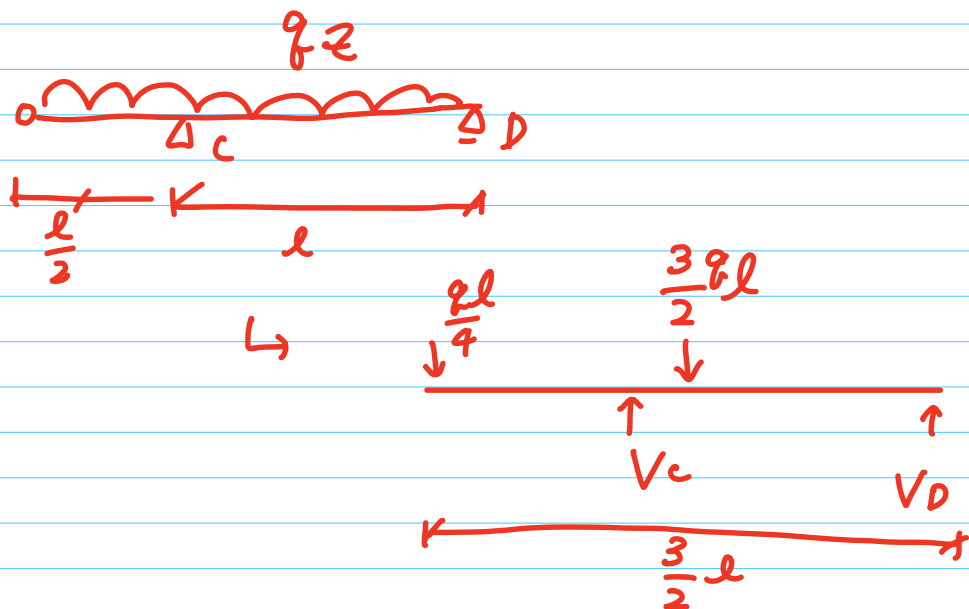
$$\downarrow Fy = -\frac{ql}{4} + qz + Sz = 0$$

$$Sz = -qz + \frac{ql}{4}$$

$$\downarrow Mz = Mz + qz \times \frac{z}{2} - \frac{ql}{4} \cdot z = 0$$

$$Mz = \frac{ql}{4}z - \frac{qz^2}{2}$$

残りの部分



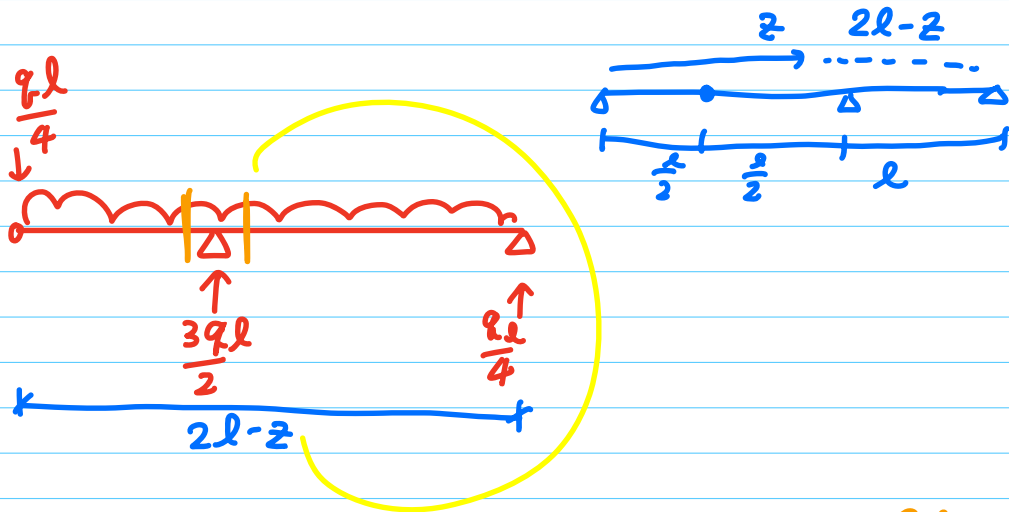
$$\sum M_o = \frac{3ql}{2} \cdot \frac{3l}{4} - V_c \cdot l + \frac{ql}{4} \cdot \frac{3l}{2} = 0$$

$$V_c l = \frac{3ql^2}{8} + \frac{ql^2}{8} = \frac{4ql^2}{8}$$

$$V_c = \frac{3}{2} ql$$

$$\sum F_y = \frac{ql}{4} + \frac{3ql}{2} - \frac{3}{2} ql - V_D = 0$$

$$V_D = \frac{ql}{4}$$

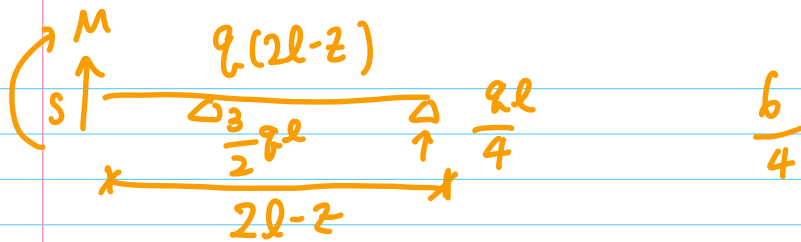


$$\sum F_y = -S + q(2l-z) - \frac{ql}{4} = 0$$

$$S = q(2l-z) + \frac{ql}{4}$$

$$\sum M = -M - q(2l-z) \cdot \frac{2l-z}{2} + \frac{ql}{4}(2l-z)$$

$$\therefore M = -\frac{q}{2}(2l-z)^2 + \frac{ql}{4}(2l-z)$$



$$\downarrow \sum F_y = -S + q(2l-z) - \frac{3ql}{2} - \frac{ql}{4} = 0$$

$$S = q(2l-z) - \frac{7ql}{4}$$

$$= 2ql - qlz - \frac{7ql}{4}$$

A-B

$$S_z = -qlz + \frac{ql}{4}$$

$$= -qlz + \frac{ql}{4}$$

$$\downarrow \sum M_z = -M_z - q(2l-z) \cdot \frac{2l-z}{2} + \frac{3ql}{2} \cdot (l-z) + \frac{ql}{4} (2l-z)$$

$$M_z = -\frac{q}{2} (2l-z)^2 + \frac{3ql^2}{2} - \frac{3qlz}{2} + \frac{ql^2}{2} - \frac{qlz}{4}$$

$$= -\frac{q}{2} (4l^2 - 4lz + z^2) + 2ql^2 - \frac{7}{4} qlz$$

A-B

$$M_z = \frac{ql}{4} z - \frac{qz^2}{2}$$

$$= -2ql^2 + 2qlz - \frac{q}{2} z^2 - \frac{7}{4} qlz$$

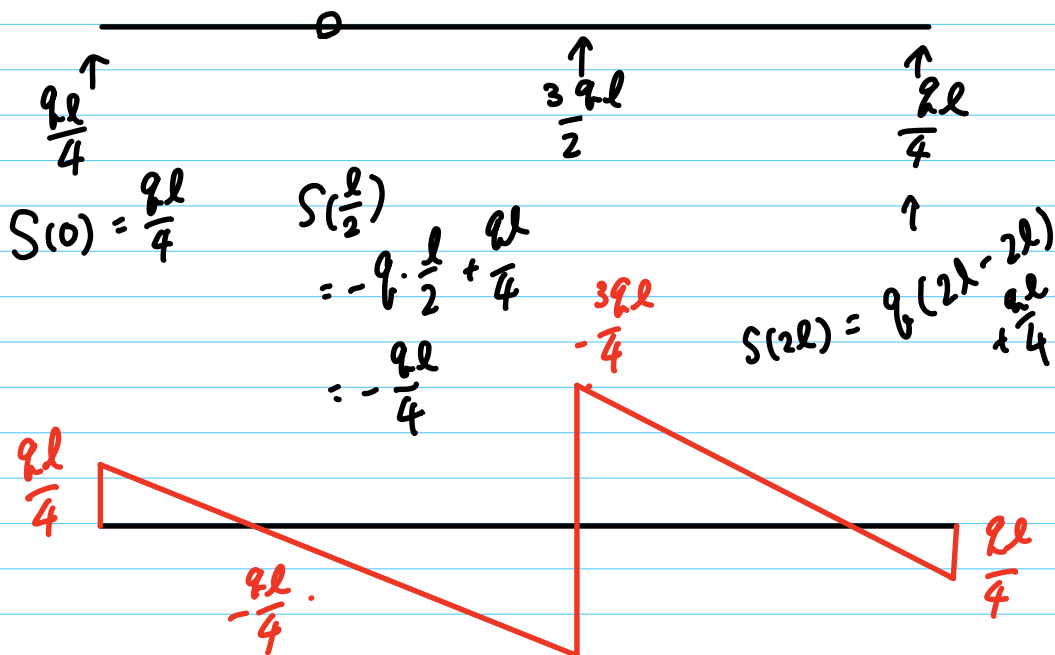
$$= -\frac{q}{2} z^2 + \frac{ql}{4} z$$

(A-B & 101C)

$$S_z \begin{cases} = -qz + \frac{qL}{4} & (0 \leq z \leq L) \\ = q(2L - z) + \frac{qL}{4} & (L \leq z \leq 2L) \end{cases}$$

$$M_z \begin{cases} = \frac{qL}{4}z - \frac{qz^2}{2} & (0 \leq z \leq L) \\ = -\frac{q}{2}(2L - z) \left\{ (2L - z) - \frac{L}{2} \right\} & \\ = -\frac{q}{2}(2L - z) \left( \frac{3L}{4} - z \right) & (L \leq z \leq 2L) \end{cases}$$

$$S(0) = -qL + \frac{qL}{4} = -\frac{3}{4}qL$$

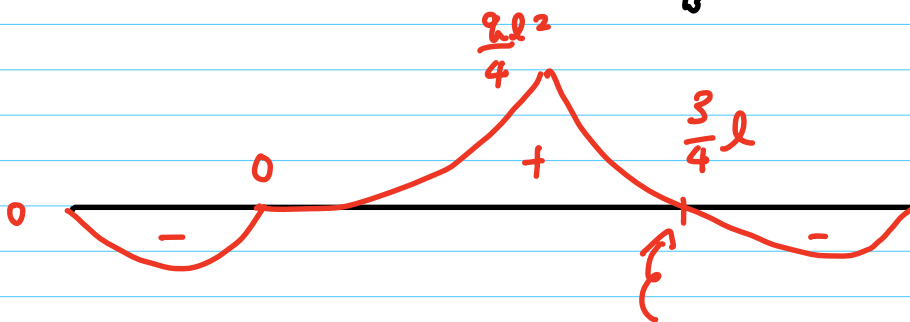


$$\begin{array}{ccccccc}
 & & & & \frac{ql^2}{4} & & \\
 & & & & | & & \\
 & & & & \text{---} & & \\
 & & & & | & & \\
 & & & & 0 & & \\
 & & & & \text{---} & & \\
 & & & & | & & \\
 & & & & 0 & & \\
 M(0) = 0 & & M\left(\frac{l}{2}\right) & & M(l) & & M(2l) = 0 \\
 & & = \frac{ql}{4} \cdot \left(\frac{l}{2}\right) - \frac{q}{2} \left(\frac{l}{2}\right)^2 & & = \frac{ql^2}{4} - \frac{ql^2}{2} & & \\
 & & = \frac{ql^2}{8} - \frac{ql^2}{8} & & = -\frac{ql^2}{4} & & 
 \end{array}$$

$$= \frac{ql}{4}z - \frac{q}{2}z^2 \quad (0 \leq z \leq l)$$

$$= -\frac{q}{2}(2l-z) \left\{ (2l-z) - \frac{l}{2} \right\}$$

$$= -\frac{q}{2}(2l-z) \left( \frac{3l}{4} - z \right) \quad (l \leq z \leq 2l)$$



$$-\frac{q}{2}(2l-z) \left( \frac{3l}{4} - z \right) = 0$$

$$z = 2l, \frac{3l}{4}$$