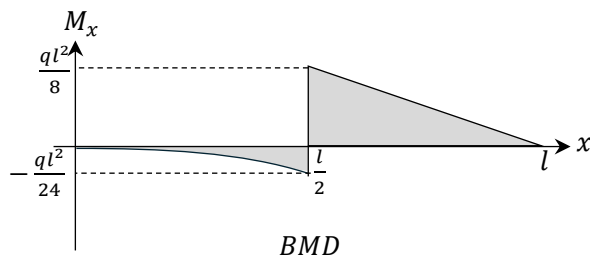
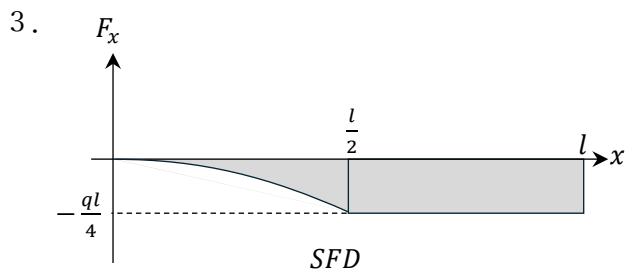


解答用紙一枚に一問ずつ解答せよ

1. (1) $y_c = \frac{45}{14}a$

(2) $I_z = \frac{1025\pi a^4}{56}$

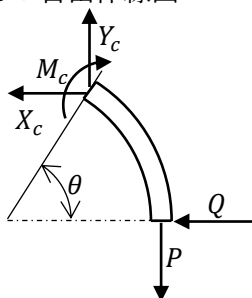
2. $\Delta l = \frac{dpl}{4tE}(1 - 2\nu)$



4. $\delta_{CV} = \frac{PL}{EA} \left(\frac{3}{2} + \frac{4}{\sqrt{3}} \right)$

5. $\theta_B = \frac{1568Ta}{33G\pi d^4}$, $\theta_C = \frac{1600Ta}{33G\pi d^4}$
BC の自由体線図

6. (1)



$\rightarrow : -X_c - Q = 0$

$\uparrow : Y_c - P = 0$

$\odot : M_c + Qr\sin\theta + Pr(1 - \cos\theta) = 0$

(2) $U = \frac{r^3}{2EI} \left(\frac{Q^2\pi}{2} + 4PQ + \frac{3P^2\pi}{2} \right)$

(3) $\delta_{BV} = \frac{\partial U}{\partial P} = \frac{r^3}{2EI} (4Q + 3P\pi)$, $\delta_{BH} = \frac{\partial U}{\partial Q} = \frac{r^3}{2EI} (Q\pi + 4P)$

(4) $\delta_{BV,Q=0} = \frac{3P\pi r^3}{2EI}$, $\delta_{BH,Q=0} = \frac{2Pr^3}{EI}$