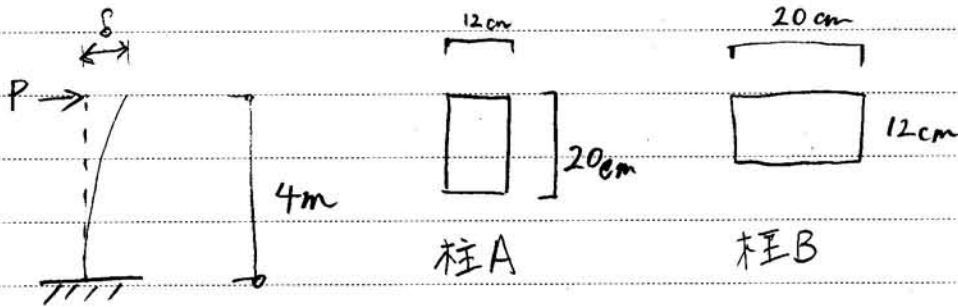


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$$I_A = \frac{12 \cdot 20^3}{12} = 8000 \text{ cm}^3$$

$$I_B = \frac{20 \times 12^3}{12} = 2880 \text{ cm}^3$$

$$1) \delta = \frac{P l^3}{3EI}$$

$$P = \frac{3EI}{l^3} \delta$$

$$K_A = \frac{3EI_A}{l^3} = \frac{123}{16} = 7.69 \text{ kN/cm}$$

$$K_B = \frac{3EI_B}{l^3} = \frac{1107}{400} = 2.77 \text{ kN/cm}$$

$$2) \sigma_y = \frac{M_y}{Z}$$

$$A: M_y = \sigma_y \times Z_A$$

$$= 23.5 \times \frac{12 \times 20^2}{6}$$

$$M_y = 18800 \text{ (kN}\cdot\text{cm)}$$

$$B: M_y = \sigma_y \times Z_B$$

$$= 23.5 \times \frac{20 \times 12^2}{6}$$

$$M_y = 11280 \text{ (kN}\cdot\text{cm)}$$

$$A: M_y = P_y \times 400$$

$$18800 = P_y \times 400$$

$$P_y = 47 \text{ (kN)}$$

$$B: M_y = P_y \times 400$$

$$11280 = P_y \times 400$$

$$P_y = 28.2 \text{ (kN)}$$

$$3) A: \delta_y = \frac{P_y l^3}{3EI} = \frac{47 \times 400^3}{3 \times 20500 \times 8000}$$

$$= \frac{752}{123}$$

$$= 6.11 \text{ (cm)}$$

$$R_y = \frac{\delta_y}{400} = 0.0153$$

$$B: \delta_y = \frac{P_y l^3}{3EI} = \frac{28.2 \times 400^3}{3 \times 20500 \times 2880}$$

$$= \frac{3760}{369}$$

$$= 10.2 \text{ (cm)}$$

$$R_y = \frac{\delta_y}{400} = 0.0255$$

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4) A: $M_P = \sigma_s \times Z_P$

$= 23.5 \times \frac{12 \times 20^2}{4}$

$M_P = 28200 \text{ (kNcm)}$

$M_P = P_P \times 400$

$P_P = 70.5 \text{ (kN)}$

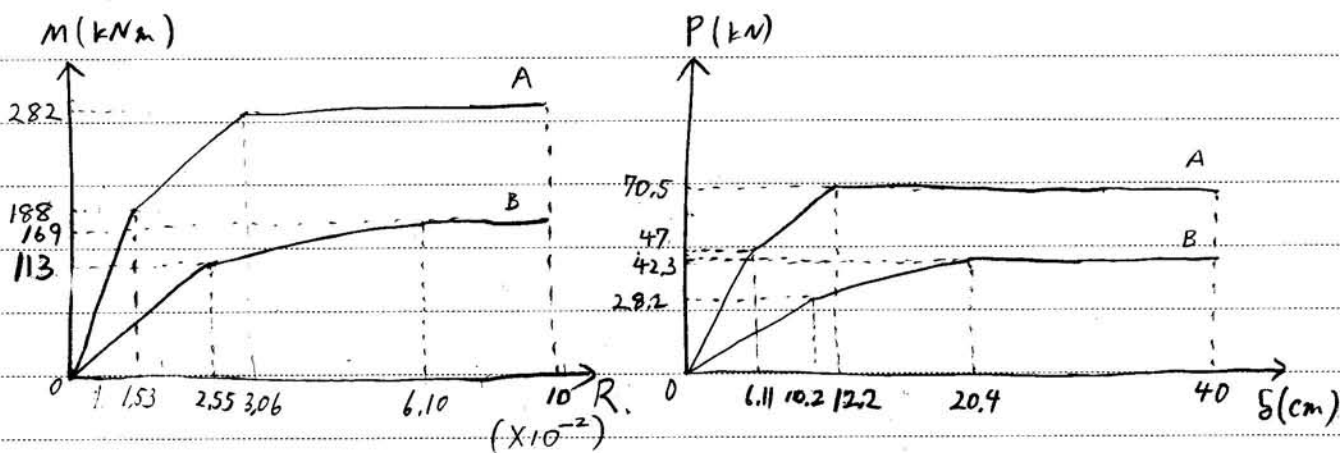
B: $M_P = 23.5 \times \frac{20 \times 12^2}{4}$

$M_P = 16920 \text{ (kNcm)}$

$P_P = \frac{16920}{400}$

$P_P = 42.3 \text{ (kN)}$

5)



$P = k_A \delta$

$M = P \times 400$

$= 400 k_A \delta$

$= 400 k_A \times 400 R$

A: $M_1 = 160000 k_A R$

$M_1 = 1230000 R$

$M_2 = \frac{1230000}{2} (R_2 - 0.0153) + 18800$

$M_2 = 615000 (R_2 - 0.0153) + 18800$

$28200 = 615000 (R_2 - 0.0153) + 18800$

$R_2 = 0.0306$

B: $M_1 = 160000 k_B R$

$M_1 = 442800 R$

$M_2 = \frac{442800}{2} (R_2 - 0.0255) + 11280$

$16920 = 221400 (R_2 - 0.0255) + 11280$

$R_2 = 0.0509774 = 0.0610$

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$$A: 70.5 = \frac{123}{16} \times \frac{1}{2} (\delta_2 - 6.11) + 47$$

$$\delta_2 = 12.223 \dots$$

$$\delta_2 = 12.2 \text{ (cm)}$$

$$B: 42.3 = \frac{1107}{400} \times \frac{1}{2} (\delta_2 - 10.2) + 28.2$$

$$\delta_2 = 20.389 \dots$$

$$\delta_2 = 20.4 \text{ (cm)}$$

部材角

$$R = \frac{\delta}{400} = 0.1 \Leftrightarrow \delta = 40 \text{ (cm)}$$

$$6) \frac{P_{rA}}{P_{rB}} = \frac{70.5}{42.3} = \frac{5}{3}$$

$$= \underline{\underline{1.67 \text{ (倍)}}}$$