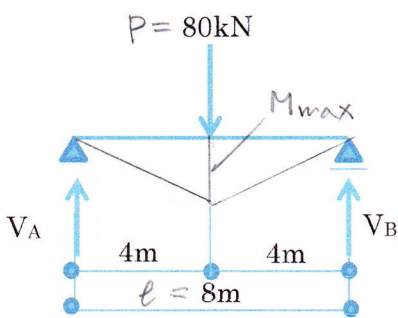


解答例

学籍番号	氏名	実施日	月	日
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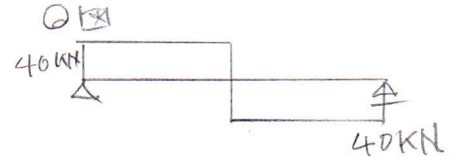
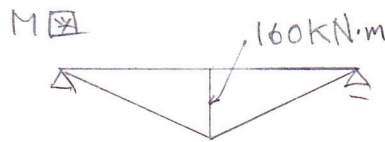
以下に示す静定梁の反力(V_A, V_B, M_A 等)を算出し、曲げモーメント図とせん断力図を描きなさい。

(1)

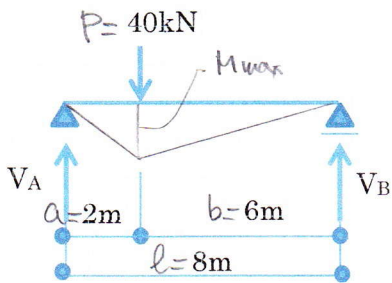


$$V_A = V_B = \frac{P}{2} = 40 \text{ kN}$$

$$M_{\max} = V_A \times 4^{\text{m}} = 160 \text{ kN}\cdot\text{m}$$



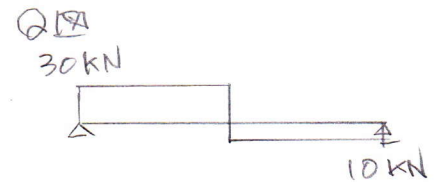
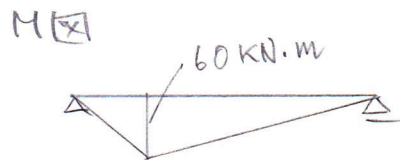
(2)



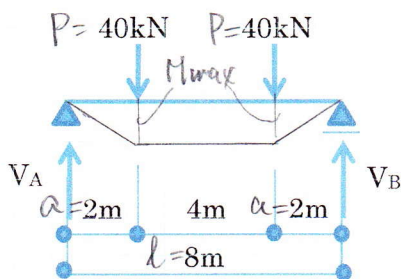
$$V_A = P \times \frac{b}{l} = 30 \text{ kN}$$

$$V_B = P \times \frac{a}{l} = 10 \text{ kN}$$

$$M_{\max} = V_A \times a = 60 \text{ kN}\cdot\text{m}$$



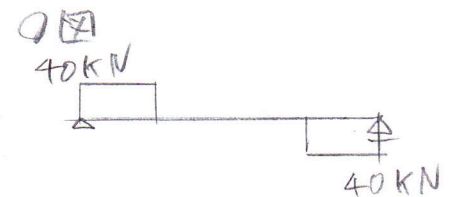
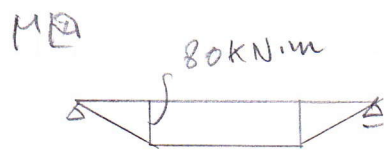
(3)



対称性より

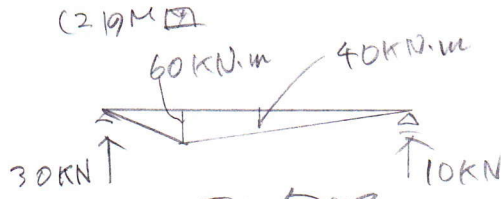
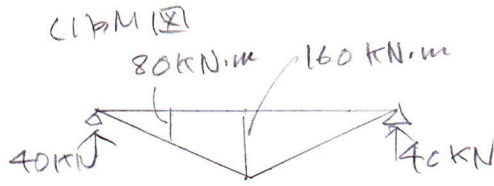
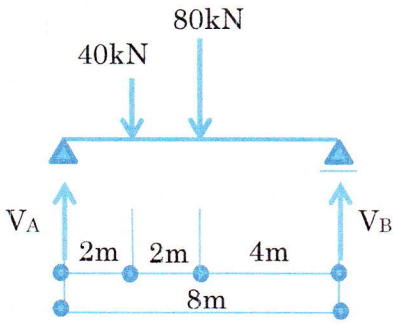
$$V_A = V_B = P = 40 \text{ kN}$$

$$M_{\max} = V_A \times a = 80 \text{ kN}\cdot\text{m}$$

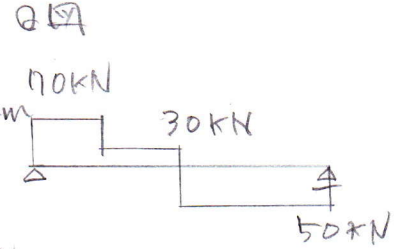
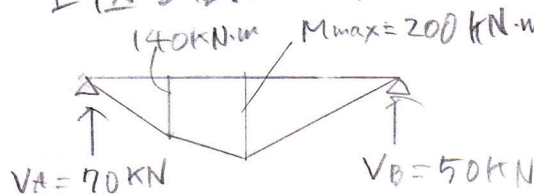


(4)

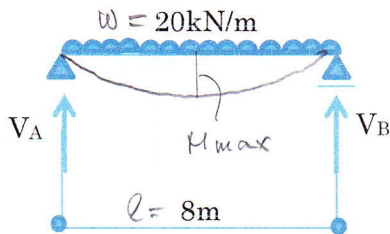
向題(1)と(2)を重ね合せたM図を求めよ。



上記を重ね合せよ。

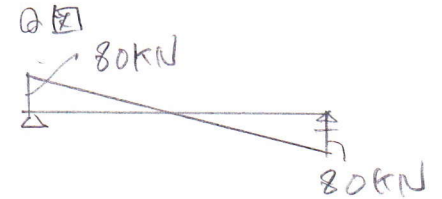
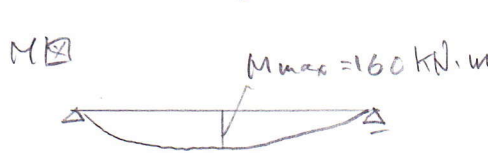


(5)



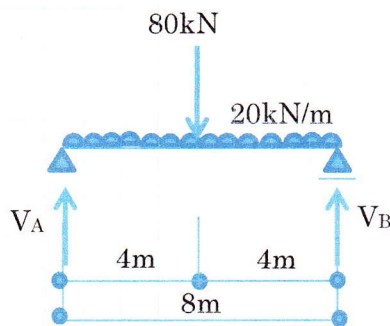
$$V_A = V_B = \frac{wl}{2} = 80 \text{ kN}$$

$$M_{max} = \frac{wl^2}{8} = 160 \text{ kN}\cdot\text{m}$$

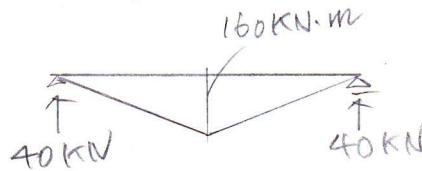


(6)

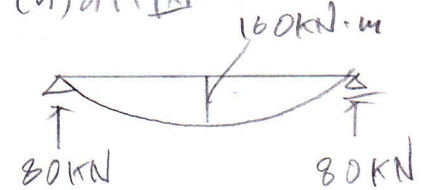
向題(1)と(5)を重ね合せたM図を求めよ。



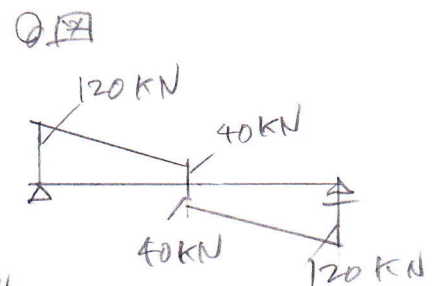
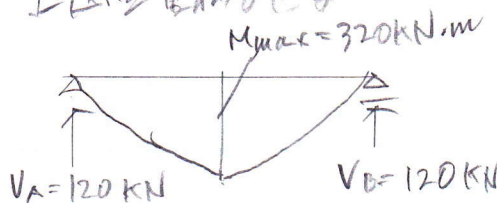
(1)のM図

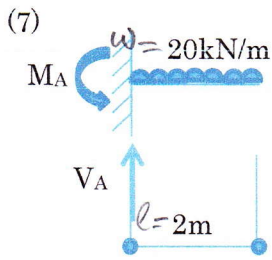


(5)のM図



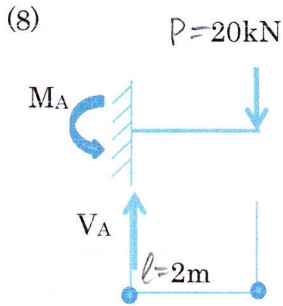
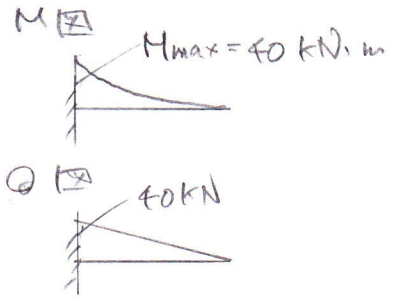
上記を重ね合せよ





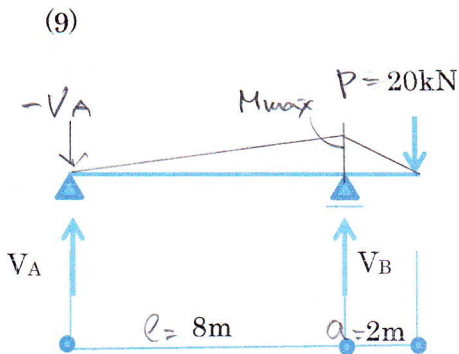
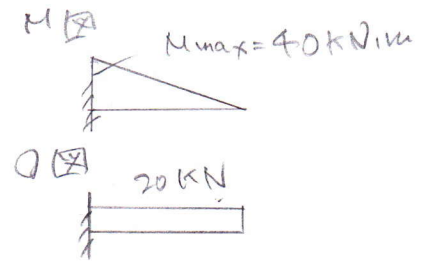
$$V_A = wl = 40 \text{ kN}$$

$$M_A = \frac{wl^2}{2} = 40 \text{ kN}\cdot\text{m}$$



$$V_A = P = 20 \text{ kN}$$

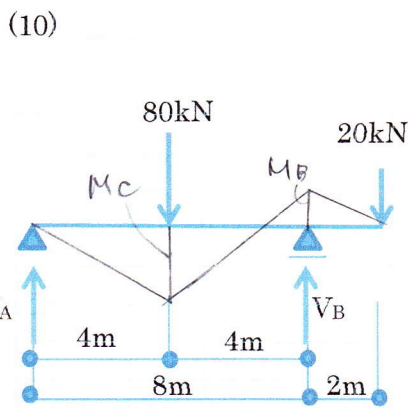
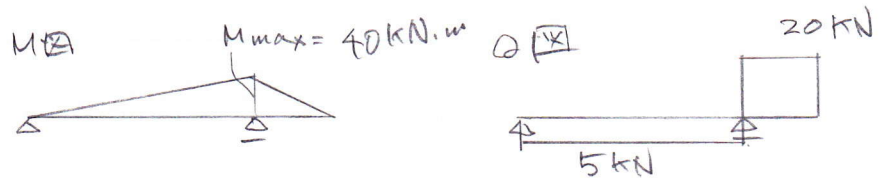
$$M_A = Pl = 40 \text{ kN}\cdot\text{m}$$



$$M_{\max} = P \cdot a = 40 \text{ kN}\cdot\text{m}$$

$$-V_A = \frac{M_{\max}}{l} = \frac{40}{8} = 5 \text{ kN} \quad V_A = -5 \text{ kN}$$

$$V_B = -V_A + P = 5 + 20 = 25 \text{ kN}$$



问题(11)と(9)を重畳するとM図を求めよ。

