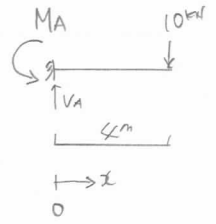
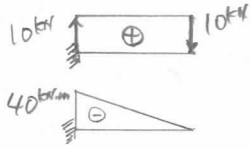
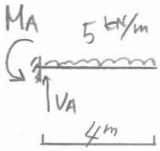
① 

$\Sigma Y = V_A - 10 = 0 \quad \therefore V_A = 10^{kN}$

$-M_A = -10 \times 4 \quad \therefore M_A = 40^{kN\cdot m}$

$M_x = -40 + 10x \quad , \quad Q_x = (M_x)' = 10$



② 

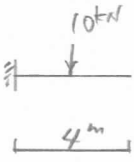
$\Sigma Y = V_A - 5 \times 4 = 0 \quad \therefore V_A = 20^{kN}$

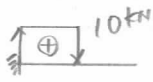
$-M_A = -5 \times 4 \times \frac{4}{2} \quad \therefore M_A = 40^{kN\cdot m}$

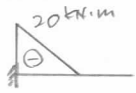
$M_x = -40 + 20 \times x - 5 \times x \times \frac{x}{2}$

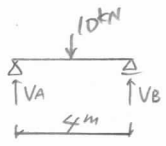
$= -40 + 20x - \frac{5}{2}x^2$

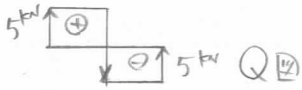
$Q_x = (M_x)' = 20 - 5x$

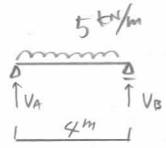
③ 





④ 



⑤ 

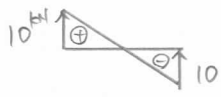
$\Sigma Y = V_A - 5 \times 4 + V_B = 0 \quad \cdots ①$

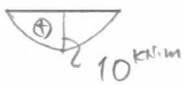
$M_A = 5 \times 4 \times \frac{4}{2} - V_B \times 4 = 0 \quad \cdots ②$

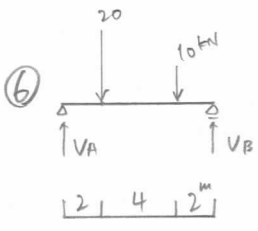
①, ②より $V_A = V_B = 10^{kN}$

$M_x = 10 \cdot x - 5x \cdot \frac{x}{2} = 10x - \frac{5}{2}x^2$

$Q_x = (M_x)' = 10 - 5x$



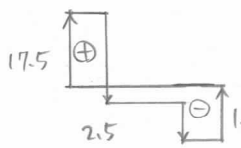


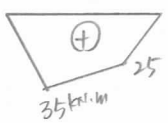
⑥ 

$\Sigma Y = V_A - 20 - 10 + V_B = 0 \quad \cdots ①$

$M_A = 20 \times 2 + 10 \times 6 - V_B \times 8 = 0 \quad \cdots ②$

①②より $V_A = 17.5^{kN}, \quad V_B = 12.5^{kN}$



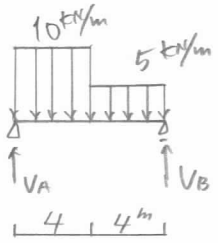


$M_x = 17.5x \ (0 \leqq x \leqq 2) \ , \ 17.5x - 20(x-2) \ (2 \leqq x \leqq 6) \ , \ 17.5x - 20(x-2) - 10(x-6) \ (6 \leqq x \leqq 8)$

$= 17.5x \ \text{〃} \ , \ -2.5x + 40 \ \text{〃} \ , \ -12.5x + 100 \ \text{〃}$

$Q_x = 17.5 \ \text{〃} \ , \ -2.5 \ \text{〃} \ , \ -12.5 \ \text{〃}$

⑦



$\sum Y = V_A - 10\times4 - 5\times4 + V_B = 0$ … ①

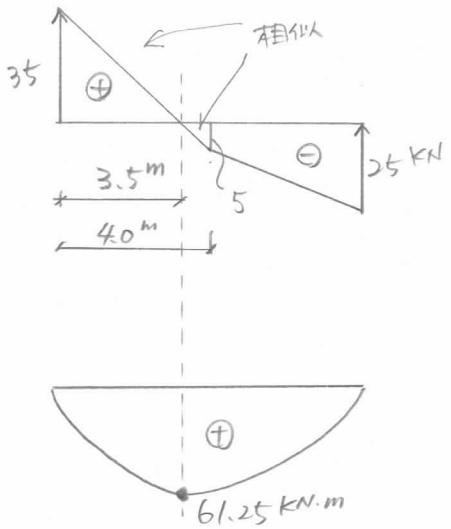
$M_A = 10\times4\times\frac{4}{2} + 5\times4\times(4+\frac{4}{2}) - V_B\times8 = 0$ … ②

①, ② より $V_A = 35\ kN$, $V_B = 25\ kN$

$M_x = 35x - 10\cdot x\cdot\frac{x}{2}$ $(0\leqq x\leqq 4)$, $35x - 10\times4\times(x-2) - 5\cdot(x-4)\cdot\frac{x-4}{2}$ $(4\leqq x\leqq 8)$

$= 35x - 5x^2$ 〃 , $-\frac{5}{2}x^2 + 15x + 40$ 〃

$Q_x = (M_x)' = 35 - 10x$ 〃 , $-5x + 15$ 〃



Q図

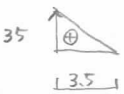
Q=0 の x の値は三角形の相似より

$x = 4\ m\times\frac{35}{35+5} = 3.5\ m$

M図

M_{max} は $x = 3.5\ m$ のとき、

$35\ kN\times3.5\ m\times\frac{1}{2} = 61.25\ (\frac{245}{4})\ kN\cdot m$



の面積.