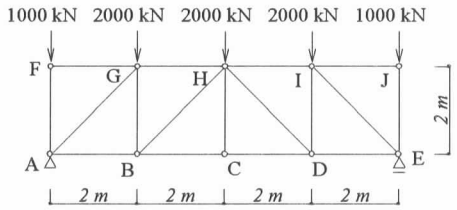
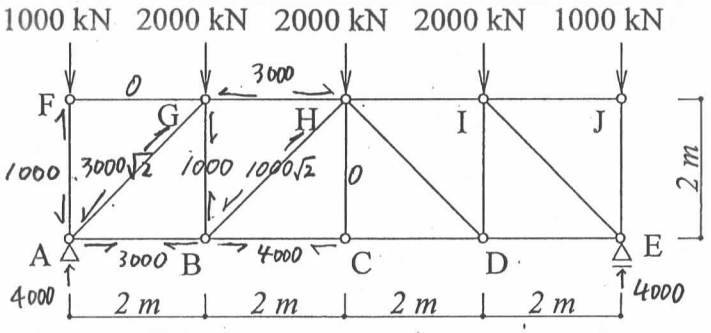
第４回　学籍番号：　　氏名

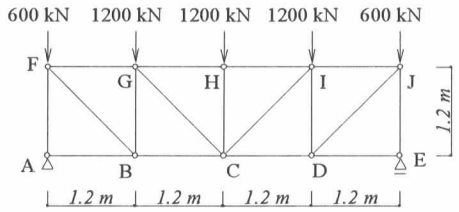
下記トラスの軸力を節点法により、すべて求めよ。

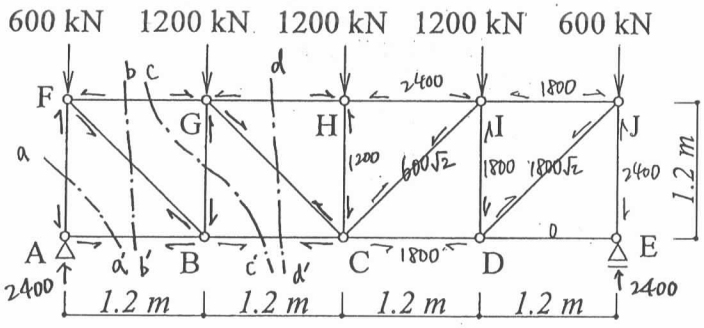




第4回　学籍番号：　　氏名

下記トラスの軸力を切断法により、すべて求めよ。





a-a' 切断で左側だけ見る。

$\Sigma Y = 2400 - N_{AF} = 0$　　$\therefore N_{AF} = 2400\ (-)$

$\Sigma X = N_{AB} = 0$　　$\therefore N_{AB} = 0$

b-b' 切断で……

$M_B = -600\times1.2 + 2400\times1.2 - N_{FG}\times1.2 = 0$　　$\therefore N_{FG} = 1800\ (-)$

$M_G = -600\times1.2 + 2400\times1.2 - N_{FB}\times1.2/\sqrt{2} = 0$　　$\therefore N_{FB} = 1800\sqrt{2}\ (+)$

c-c' 切断で…

N_{FG}

$\Sigma X = -1800 + N_{BC} = 0$　　$\therefore N_{BC} = 1800\ (+)$

$\Sigma Y = -600 + 2400 - N_{BG} = 0$　　$\therefore N_{BG} = 1800\ (-)$

d-d' 切断で…

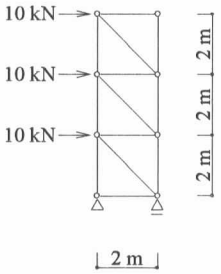
$M_C = -600\times2.4 - 1200\times1.2 + 2400\times2.4 - N_{GH}\times1.2 = 0$　　$\therefore N_{GH} = 2400\ (-)$

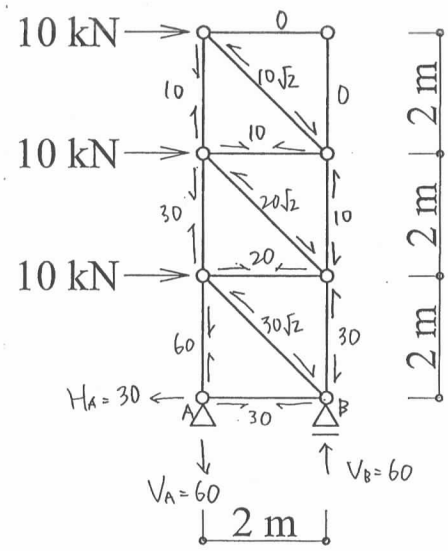
$M_H = -600\times2.4 - 1200\times1.2 + 2400\times2.4 - 1800\times1.2 - N_{CG}\times1.2/\sqrt{2} = 0$　　$\therefore N_{CG} = 600\sqrt{2}\ (+)$

H点で　$\Sigma Y = -1200 + N_{CH} = 0$　　$\therefore N_{CH} = 1200\ (-)$

第4回　学籍番号：　　氏名

下記トラスの軸力を切断法により、すべて求めよ。





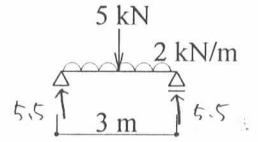
反力を求める.

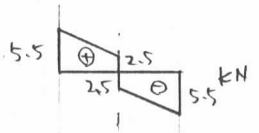
$M_A = 10\times2 + 10\times4 + 10\times6 - V_B\times2 = 0 \quad \therefore V_B = 60$

$\Sigma Y = -V_A + V_B = 0 \quad \therefore V_A = 60$

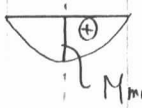
$\Sigma X = 10 + 10 + 10 - H_A = 0 \quad \therefore H_A = 30$

下記のM図、Q図をかけ。



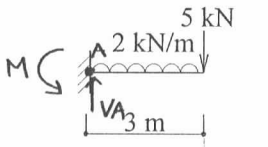


Q図



M図

$M_{max} = 6\ kN\cdot m$



$\Sigma Y = V_A - 5 - 2\times3 = 0 \quad \therefore V = 11\ kN$

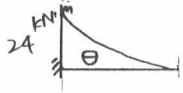
固定端モーメントの算出

A点まわりのモーメントは

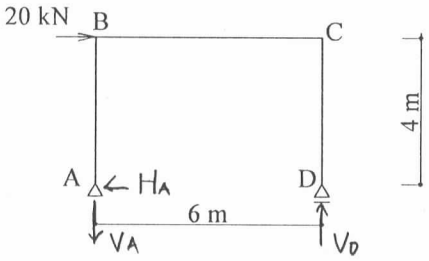
$-M + 5\ kN \times 3\ m + 2\ kN/m \times 3\ m \times \frac{3}{2}\ m = 0$

$\therefore M = 24\ kN\cdot m$

Q図



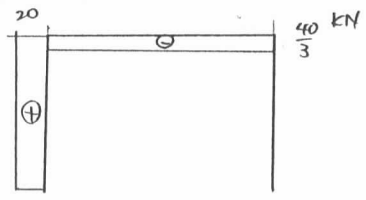
M図



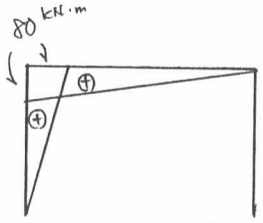
$M_A = 20\times4 - V_D \times 6 = 0 \quad \therefore V_D = \frac{40}{3}\ kN$

$\Sigma Y = -V_A + V_D = 0 \quad \therefore V_A = \frac{40}{3}\ kN$

$\Sigma X = 20 - H_A = 0 \quad \therefore H_A = 20\ kN$



Q図



M図

片持ち梁に置き換えても同じこと。