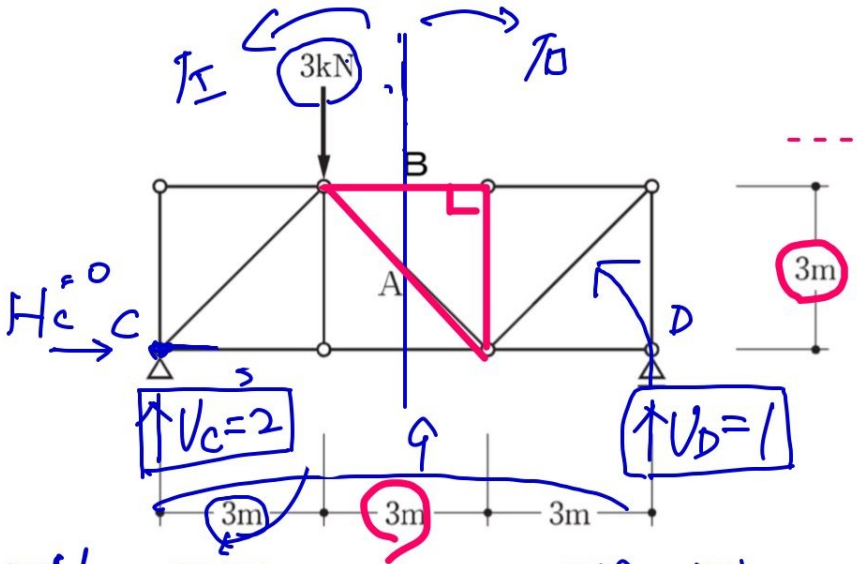
問題演習

A, B部材の軸方向力を求める



$H_C = 0$

$V_C = 2$

$V_D = 1$

$\Sigma M_C = 0$ (↺)

$-V_D \times 9 + 3 \times 3 = 0$

$-9V_D + 9 = 0$

$9V_D = 9$

$V_D = 1$

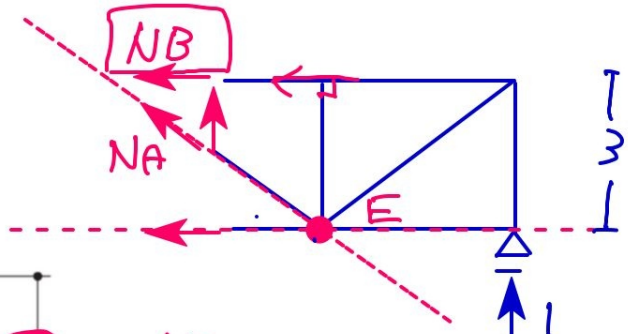
$\Sigma Y = 0$ (↑)

$V_C + V_D - 3 = 0$

1

$V_C - 2 = 0$

$V_C = 2$



N_B

$\Sigma M_E = 0$ (↺)

$-N_B \times 3 - 1 \times 3 = 0$

$-3N_B - 3 = 0$

$3N_B = -3$ $N_B = -1$ (圧)

N_A

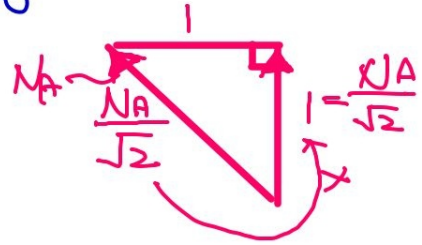
$\Sigma Y = 0$ (↑)

$+\frac{N_A}{\sqrt{2}} + 1 = 0$

$\frac{N_A}{\sqrt{2}} = -1$

$\frac{N_A}{\sqrt{2}} \sqrt{2} = -1 \cdot \sqrt{2}$

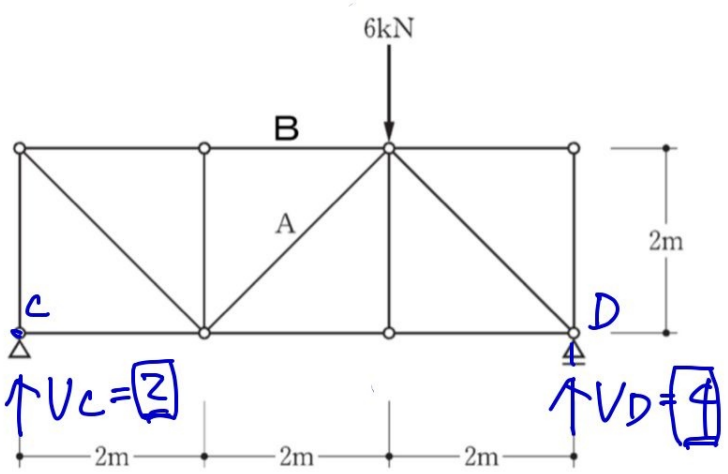
$N_A = -\sqrt{2}$ (圧)



問題演習

1. 反力を求める

A, B部材の軸方向力を求める



$\Sigma M_C = 0$ より

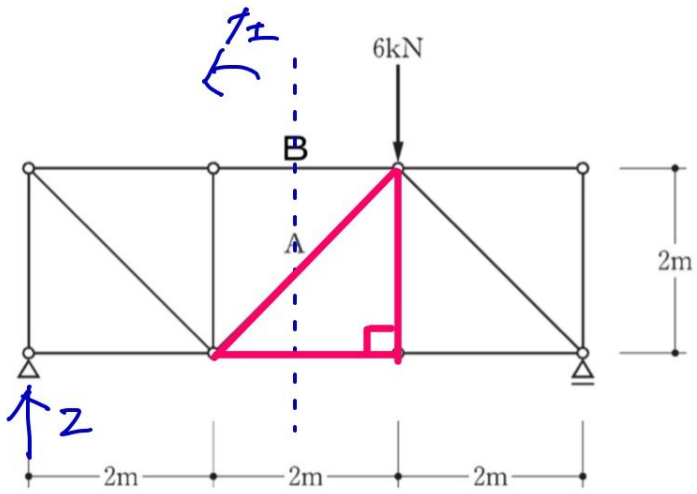
$-V_D \times 6 + 6 \times 4 = 0$

$-6V_D = -24$

$V_D = \frac{-24}{-6} = 4$ (↑)

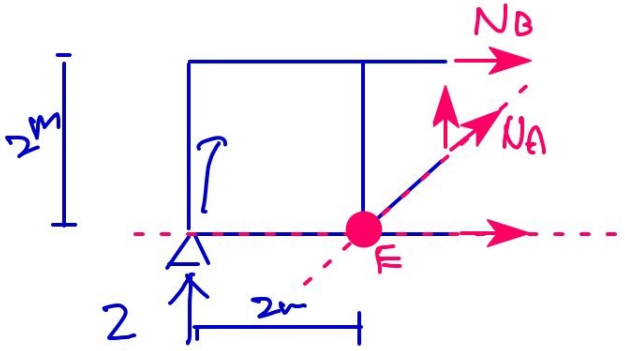
問題演習

A, B部材の軸方向力を求める



2. その節点から分離して取り出す。
3. その断面に軸方向力を＋の向きで仮定する
4. 力のつり合い式で求める

NBを求める　NAを求める

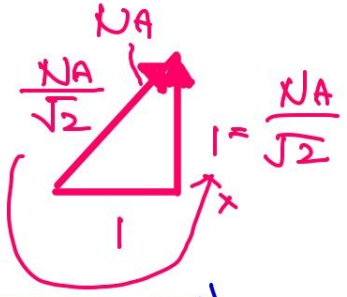


$\Sigma M_F=0$ より

$N_B \times 2 + 2 \times 2 = 0$

$2N_B = -4$

$N_B = -2$ (圧)

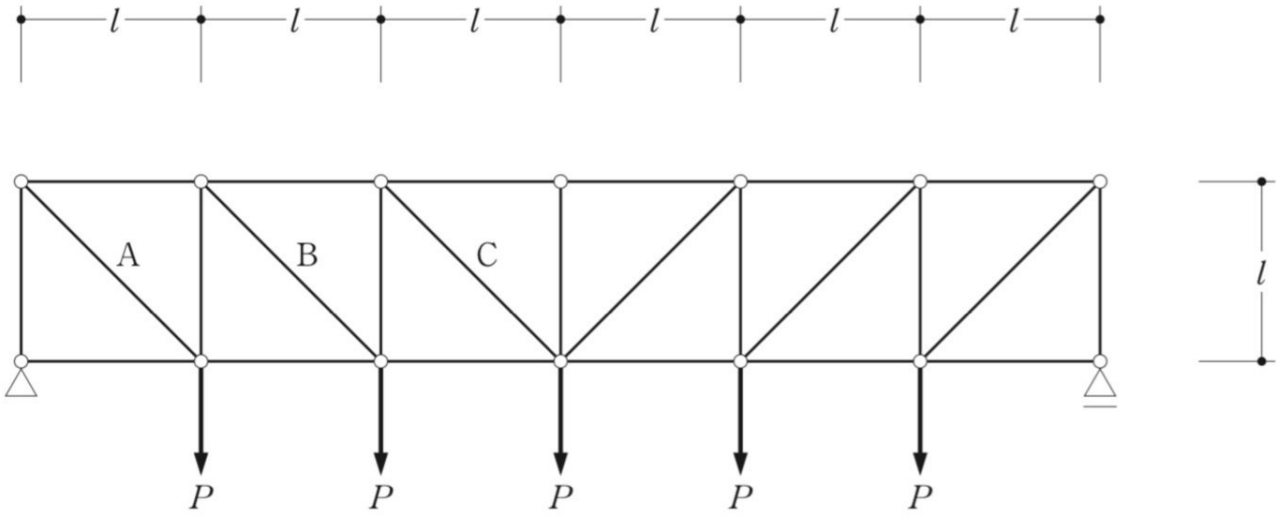


$\Sigma Y=0$ より

$\frac{N_A}{\sqrt{2}} + 2 = 0$

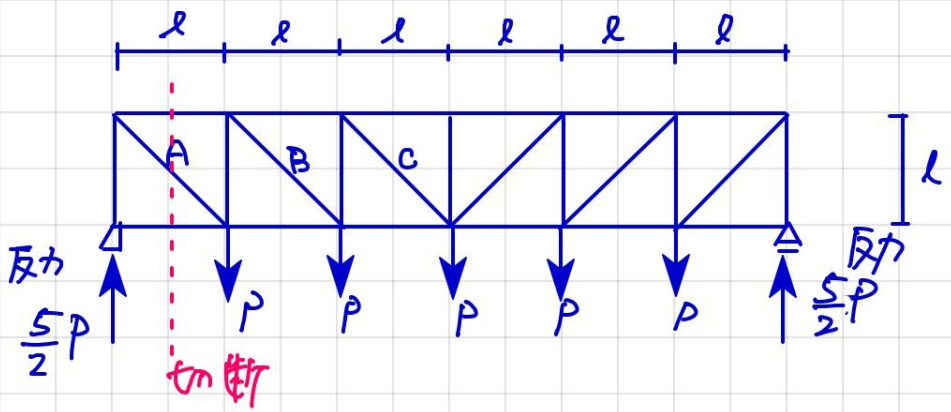
$\frac{N_A}{\sqrt{2}} = -2$

$N_A = -2\sqrt{2}$ (圧)



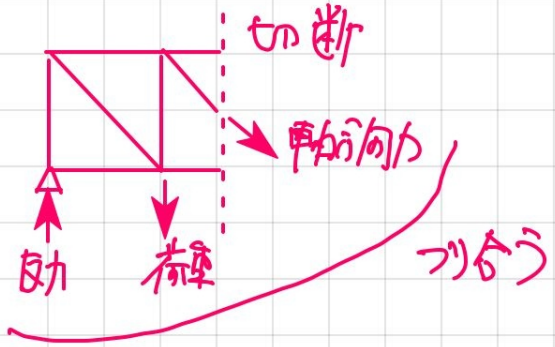
	N_A	:	N_B	:	N_C
1.	1	:	1	:	1
2.	3	:	2	:	1
3.	4	:	2	:	1
4.	5	:	3	:	1

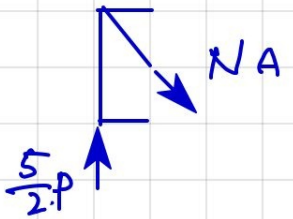
NO.5 $N_A : N_B : N_C$ を求める



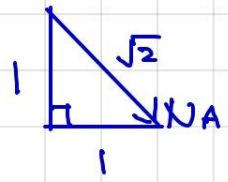
ポイント　切断法により Y方向の力のつり合い式を用いて斜材の軸方向力を求める

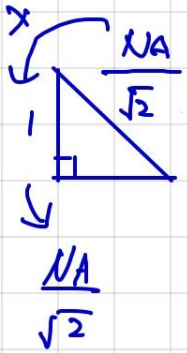
切断法：軸方向力を求めたい部材で切断して力のつり合いから応力を求める方法

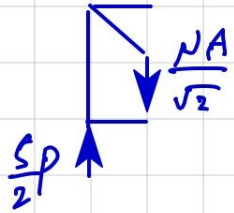




三角比







$\Sigma Y = 0$ より（Y方向の力を全て合計すると0になる）

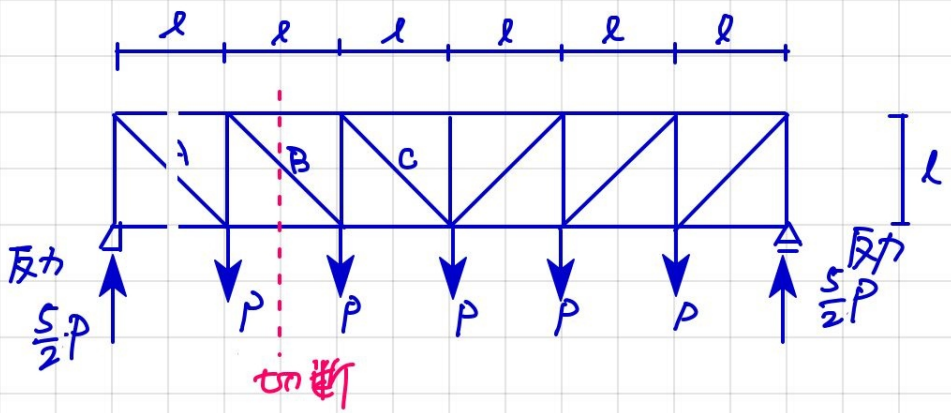
上向き＋
下向き－

$\frac{5}{2}P - \frac{N_A}{\sqrt{2}} = 0$

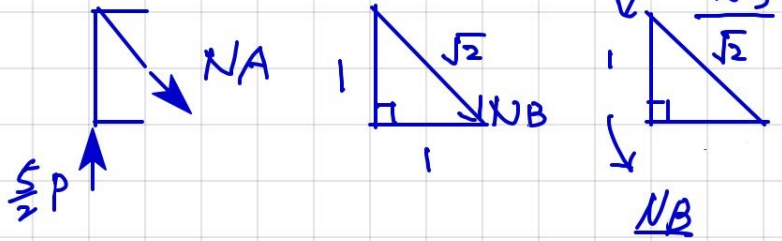
$\frac{N_A}{\sqrt{2}} = \frac{5}{2}P$

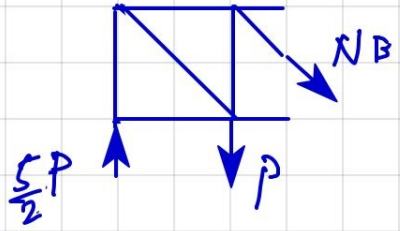
$N_A = \frac{5\sqrt{2}}{2}P$

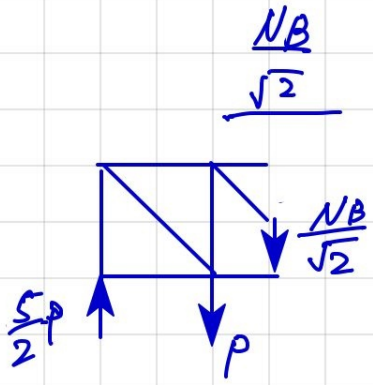
NO.5 $N_A : N_B : N_C$ を求める



三角比







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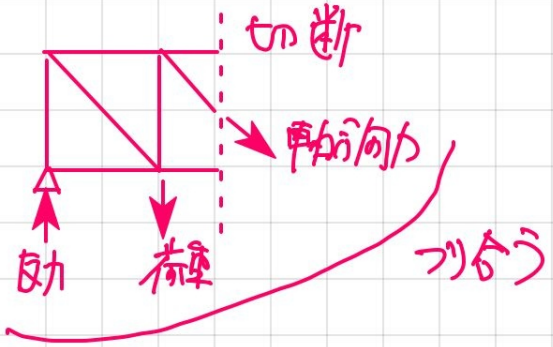


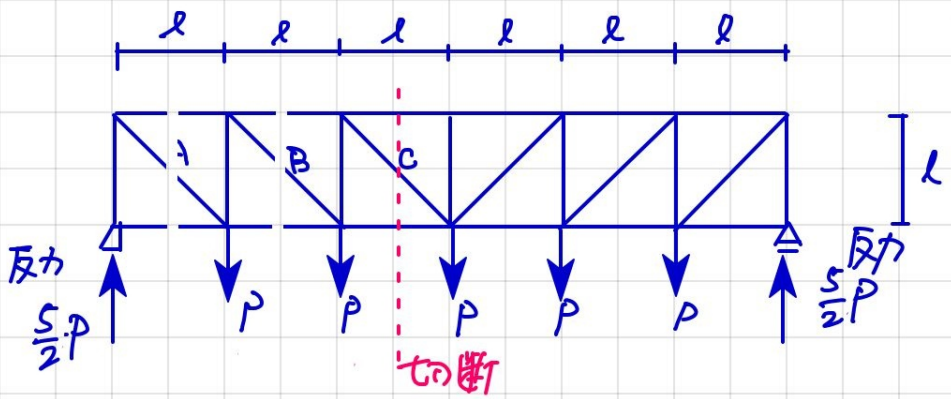
$\Sigma Y = 0$ より

$$\frac{5}{2}P - P - \frac{N_B}{\sqrt{2}} = 0$$

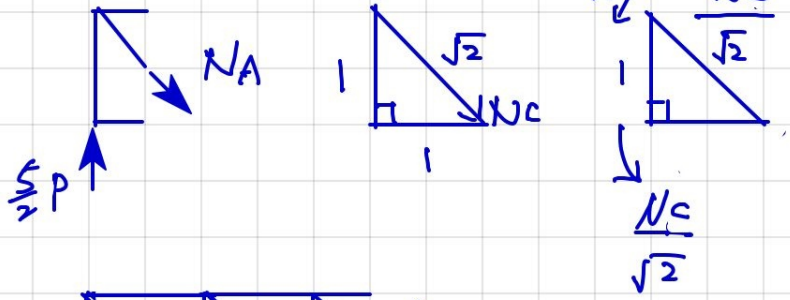
$$\frac{N_B}{\sqrt{2}} = \frac{3}{2}P$$

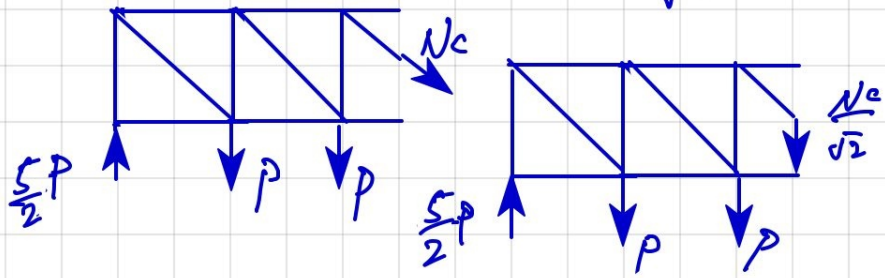
$$N_B = \frac{3\sqrt{2}}{2}P$$

NO.5 $N_A : N_B : N_C$ を求める



三角比





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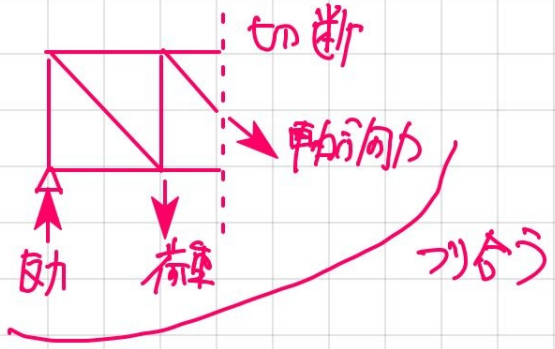


$\Sigma Y = 0$ より

$\frac{5}{2}P - P - P - \frac{N_C}{\sqrt{2}} = 0$

$\frac{N_C}{\sqrt{2}} = \frac{1}{2}P$

$N_C = \frac{\sqrt{2}}{2}P$

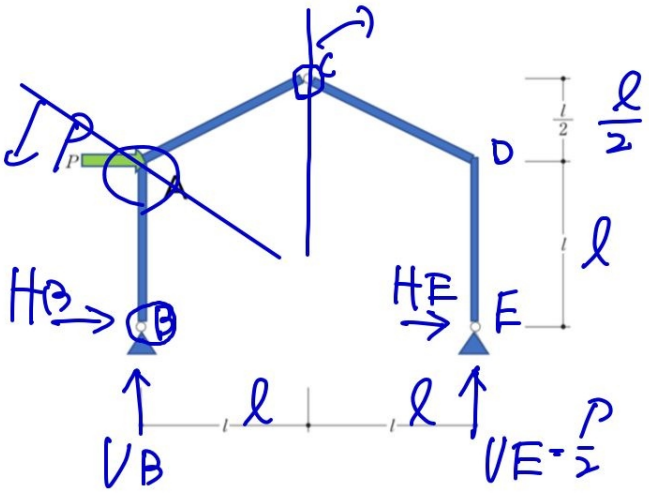
$N_A = \frac{5\sqrt{2}}{2}P$

$N_B = \frac{3\sqrt{2}}{2}P$

$N_C = \frac{\sqrt{2}}{2}P$

$N_A : N_B : N_C = 5 : 3 : 1$

H30-No3　A点の曲げモーメントを求める。



$\Sigma M_B = 0$ (↺)

$-V_E \times 2\ell + P \times \ell = 0$

$-V_E 2\ell = -P\ell$

$V_E = \frac{P}{2}$

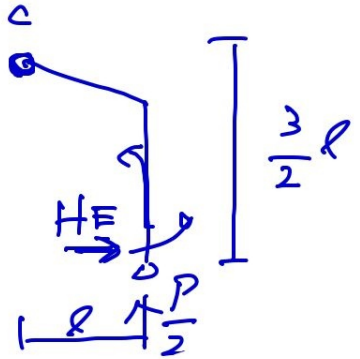
$\Sigma X = 0$

$H_B + H_E + P = 0$

$H_E = -\frac{P}{3}$ (←)

$H_B - \frac{P}{3} + P = 0$

$H_B = -\frac{2}{3}P$ (←)

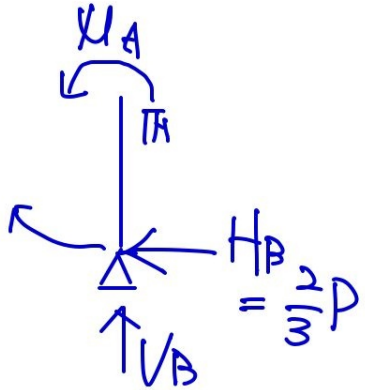


$\Sigma M_C = 0$ (↺)

$-H_E \times \frac{3}{2}\ell - \frac{P}{2} \times \ell = 0$

$-\frac{3}{2}H_E\ell = \frac{P}{2}\ell$

$H_E = -\frac{P\ell}{2} \times \frac{2}{3\ell} = -\frac{P}{3}$ (←)



$\Sigma M_A = 0$ (↺)

$-M_A + \frac{2}{3}P \times \ell = 0$

$M_A = \frac{2}{3}P\ell$