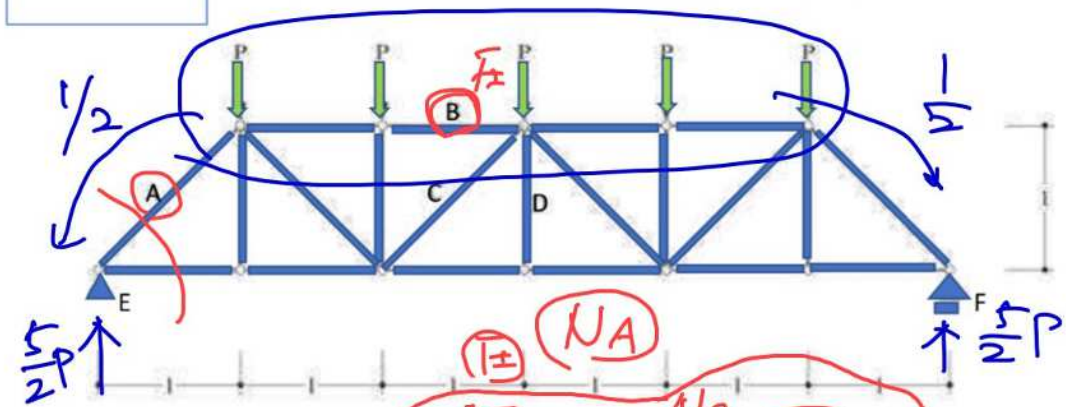
「力学計算塾」
トラス攻略
（全3回）

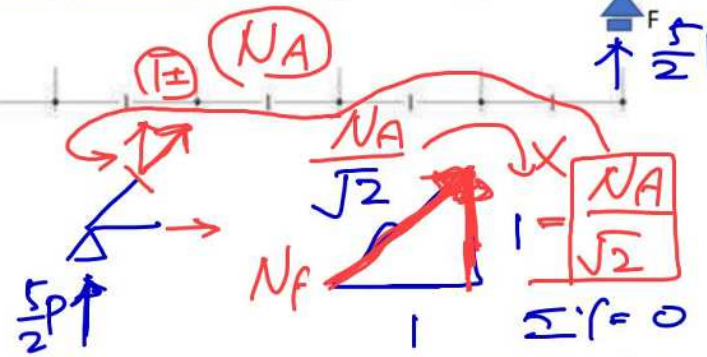
1. 出題傾向、切断法の解説、問題演習（過去問3問）
2. 節点法の解説、問題演習（過去問3問）
3. キングポストトラス、他問題演習（過去問3問）

宿題

R02-No5　A, B, C, D部材に生じる軸方向力NA, NB, NC, NDのうち誤っているものを選ぶ。



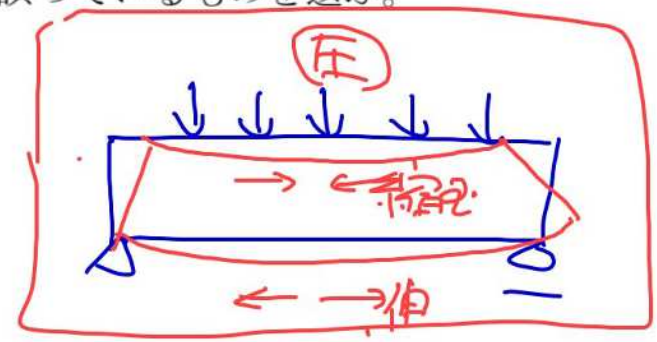
1. $N_A = -\frac{5\sqrt{2}}{2}P$
2. $N_B = -5P$
3. $N_C = -\frac{\sqrt{2}}{2}P$
4. $N_D = 0$

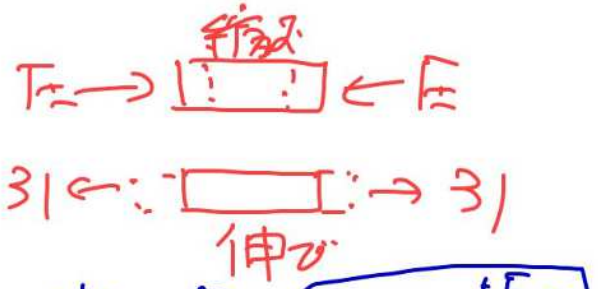


$\Sigma Y = 0$

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

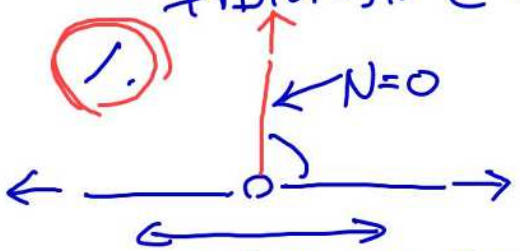
$\frac{N_A}{\sqrt{2}} = -\frac{5}{2}P$　$N_A = -\frac{5\sqrt{2}}{2}P$





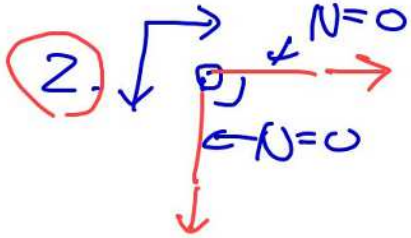
★軸方向力ゼロ部材

1.



一直線からとび出た部材は　$N=0$

2.

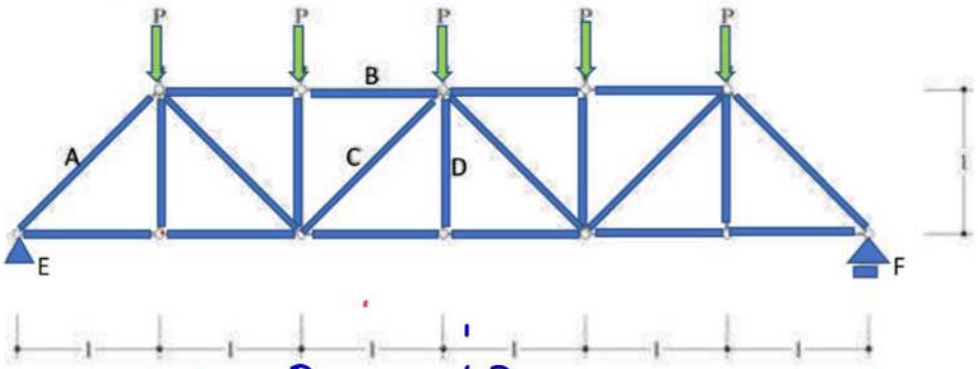


$\Sigma Y = 0$　↓=0　　$\Sigma X = 0$　→=0

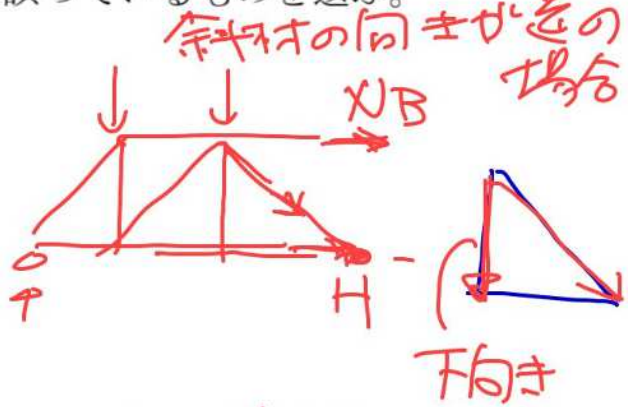
2つの部材が角度をもって接合されている（反力・荷重は作用していない）

宿題

R02-No5　A, B, C, D部材に生じる軸方向力NA, NB, NC, NDのうち誤っているものを選ぶ。

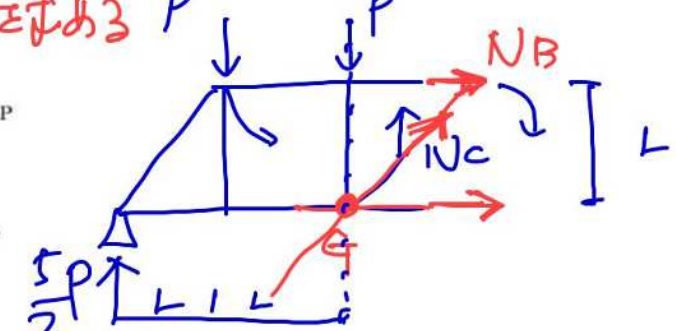


斜材の向きが逆の場合



1. $N_A = -\frac{5\sqrt{2}}{2}P$
2. $N_B = -5P$
3. $N_C = -\frac{\sqrt{2}}{2}P$
4. $N_D = 0$

NBを求める



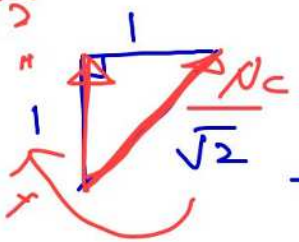
$\Sigma M_G = 0$

$N_B \times L + \frac{5}{2}P \times 2L - P \times L = 0$

$N_B L = -4PL$

$N_B = -4P$

NCを求める



$\Sigma Y = 0$

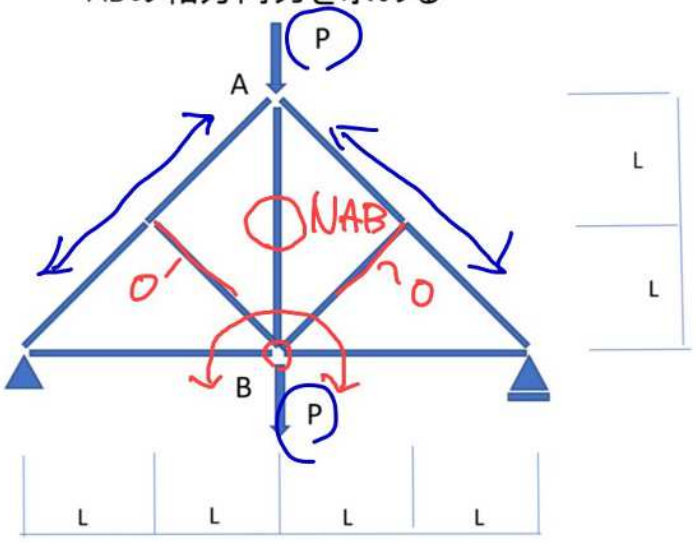
$+\frac{N_C}{\sqrt{2}} + \frac{5}{2}P - P - P = 0$

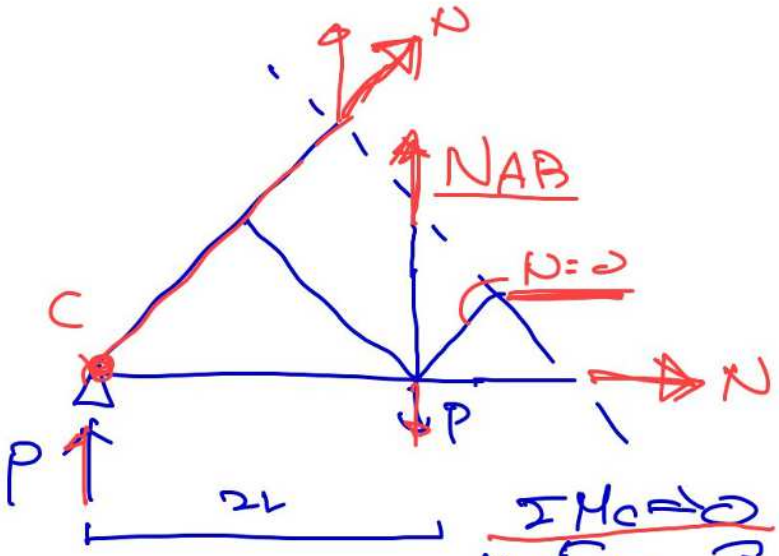
$\frac{N_C}{\sqrt{2}} = -\frac{1}{2}P$

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

節点法の解説（H19-No4）

・ABの軸方向力を求める

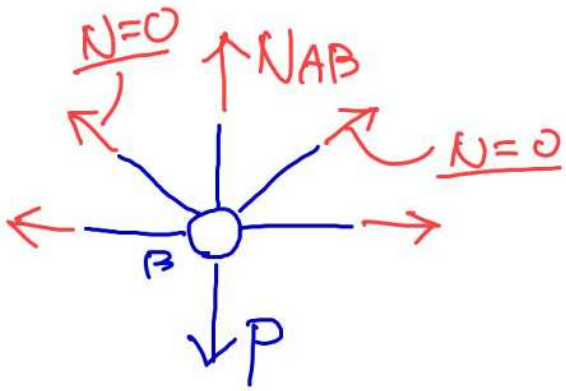


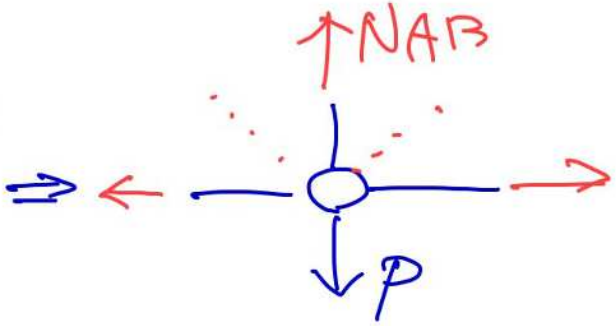


$\Sigma M_C = 0$

$-N_{AB} \times 2L + P \times 2L = 0$

$N_{AB} = P$





$\Sigma Y = 0$

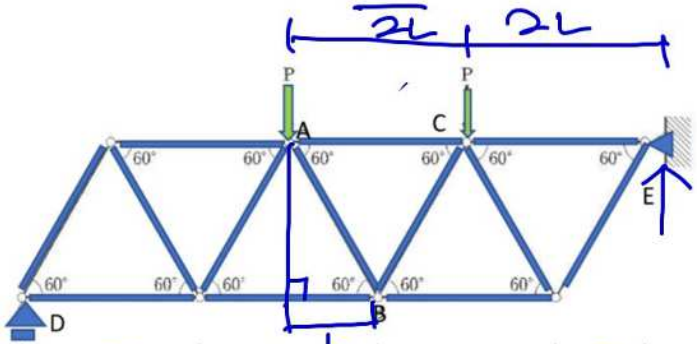
$N_{AB} - P = 0$

$N_{AB} = P$

☆の開いた状態でつり合い式が成り立つ

問題演習（R01-No5）

・横型平行弦トラス①斜材ABの軸方向力を求める ②平行弦ACの軸方向力を求める



$\frac{6}{7}P$ V_D 2L 2L 2L L

V_Dを求める $\Sigma M_E = 0$

$V_D \times 7L - P \times 4L - P \times 2L = 0$

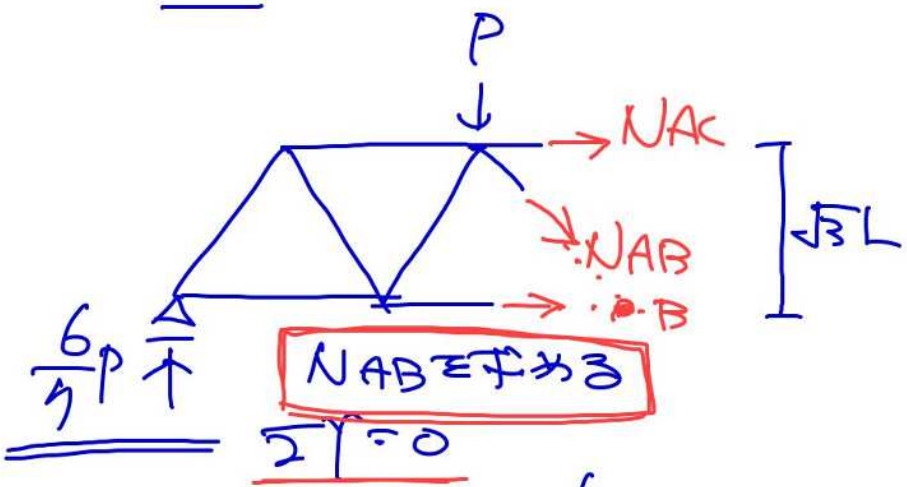
$V_D = \frac{6}{7}P$

N_{AC}を求める

$\Sigma M_B = 0$

$N_{AC} \times \sqrt{3}L + \frac{6}{7}P \times 4L - P \times L = 0$

$N_{AC} = -\frac{8}{7\sqrt{3}}P$

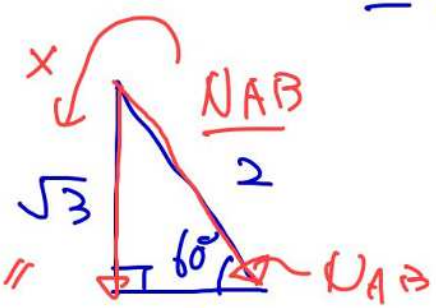


N_{AB}を求める

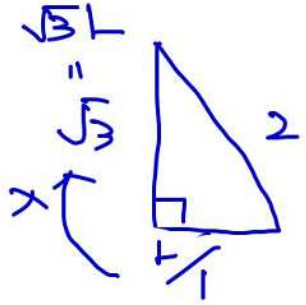
$\Sigma = 0$

$-\frac{\sqrt{3}}{2}N_{AB} + \frac{6}{7}P - P = 0$

$N_{AB} = -\frac{2}{7\sqrt{3}}P$

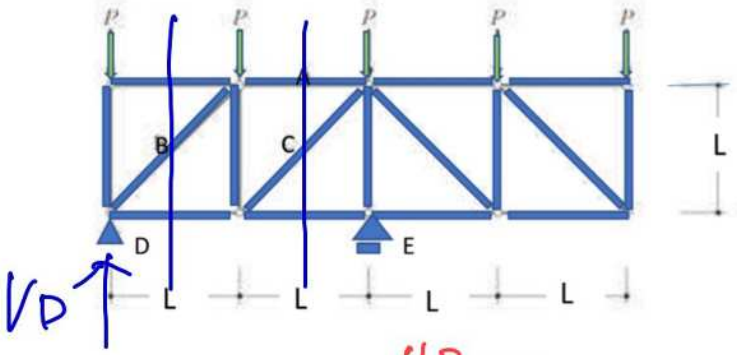


$\frac{\sqrt{3}}{2}N_{AB}$



問題演習（R04-No5）

・A,B,C部材に生じる軸方向力NA,NB,NCの大小関係を求める



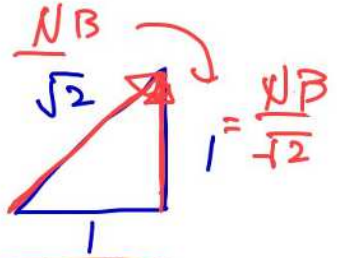
1. $N_A < N_B < N_C$
2. $N_B < N_A < N_C$
3. $N_C < N_A < N_B$
4. $N_C < N_B < N_A$

反力を求める

$\Sigma M_E = 0$

$V_D \times 2L - P \times 2L - P \times L + P \times L + P \times 2L = 0$

$V_D = 0$

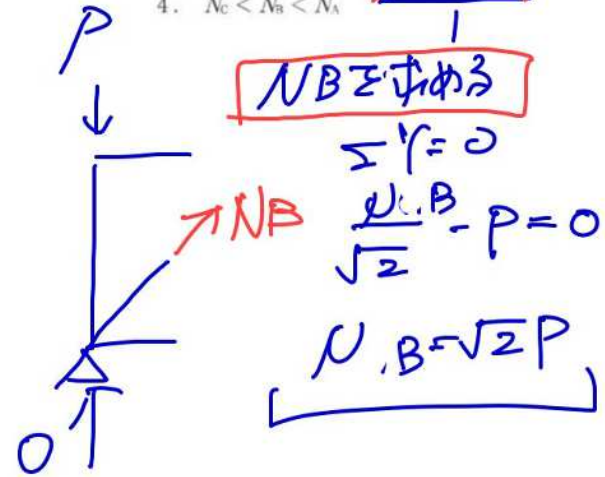


NBを求める

$\Sigma Y = 0$

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

$N_B = \sqrt{2}P$

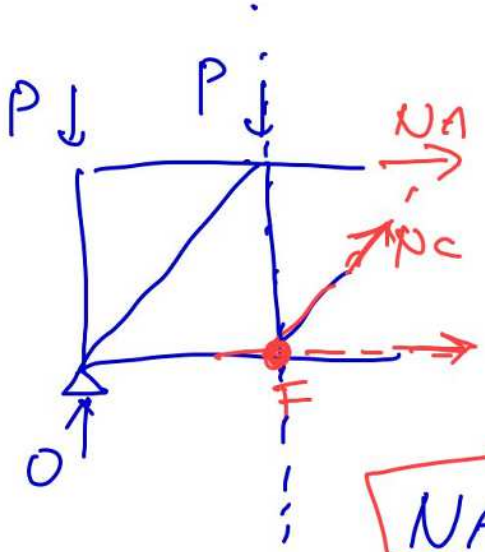


Ncを求める

$\Sigma Y = 0$

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

$N_C = 2\sqrt{2}P$



NAを求める

$\Sigma M_F = 0$

$N_A \times L - P \times L = 0$

$N_A = P$

$N_A < N_B < N_C$