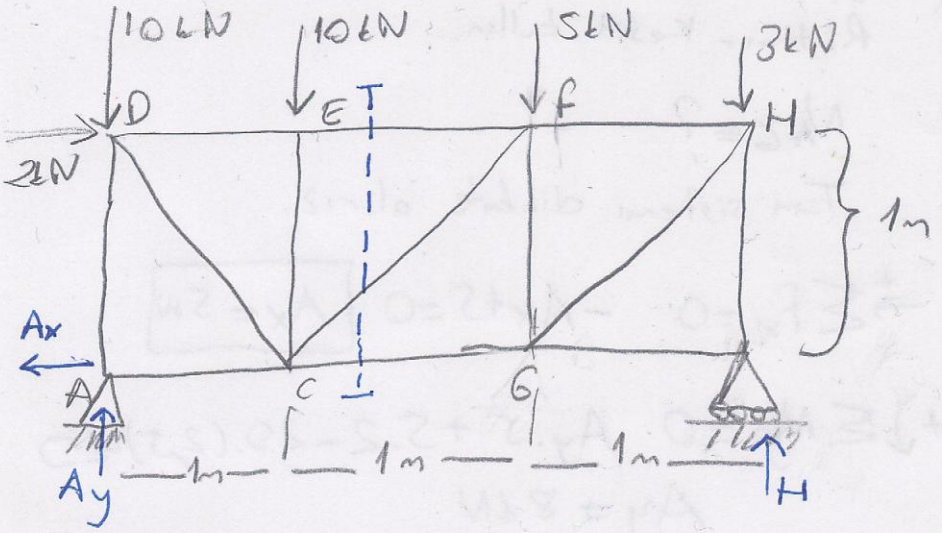
Ritter Kesit Metodu



Avantaj

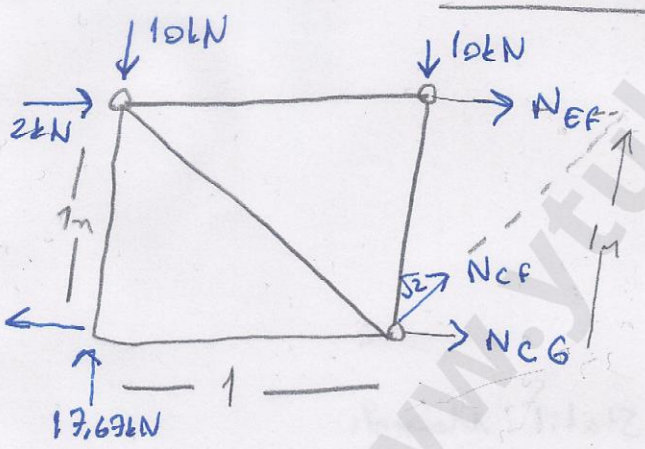
Moment alınabilir.

$\overset{+}{\rightarrow}\sum f_x = 0 \quad 2 - A_x = 0$

$A_x = 2$

$+\circlearrowleft \sum M_H = 0 \quad A_y \cdot 3 + 2.1 - 10.3 - 10.2 - 5.1$

$\uparrow A_y = 17,67\ kN$



II-II kesitini dikkate alırsak;

$+\circlearrowleft \sum M_f = 0$

$2.1 - 10.2 - 10.1 - N_{CG}.1 + (17,67).2 = 0$

$N_{CG} = 7,34\ kN$

$+\circlearrowleft \sum M_C = 0$

$(17.67).1 + 2.1 - 10.1 + N_{EF} = 0$

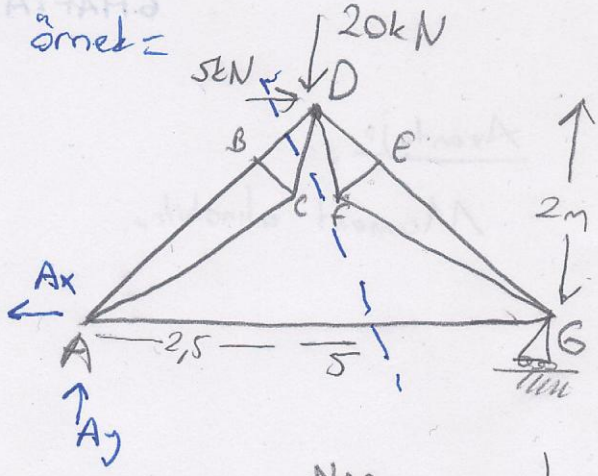
$N_{EF} = -9,67\ kN$

$\overset{+}{\rightarrow}\sum f_x = 0 \quad -2 + 2 + N_{EF} + N_{CG} + N_{CF}.\frac{1}{\sqrt{2}} = 0$

($N_{EF} \downarrow -9.67$, $N_{CG} \downarrow 7.34$)

$N_{CF} = \_\_\_\_ kN$

Örnek:



Düğüm metodunda 3 taneyle olmaz.
Ritter- Kesit tüllan.

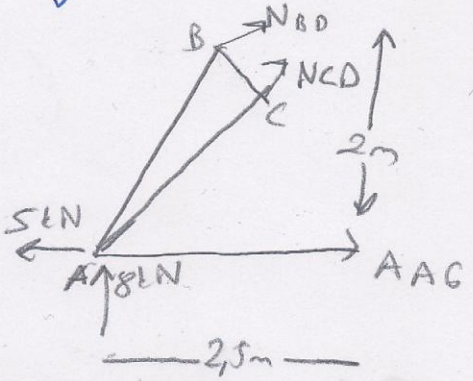
$N_{AG} = ?$

Tüm sistemi dikkate alıyoruz.

$\rightarrow^{+} \sum F_x = 0 \quad -A_x + 5 = 0 \quad \boxed{A_x = 5\,kN}$

$+\circlearrowright \sum M_F = 0 \quad A_y \cdot 5 + 5 \cdot 2 - 20 \cdot (2,5) = 0$

$A_y = 8\,kN$

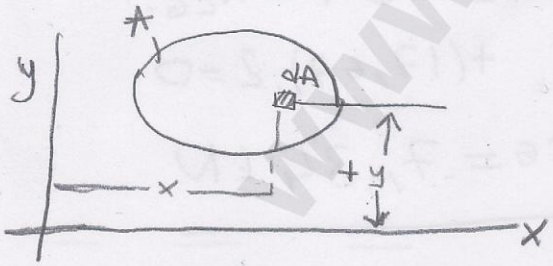


$+\circlearrowright \sum M_D = 0$

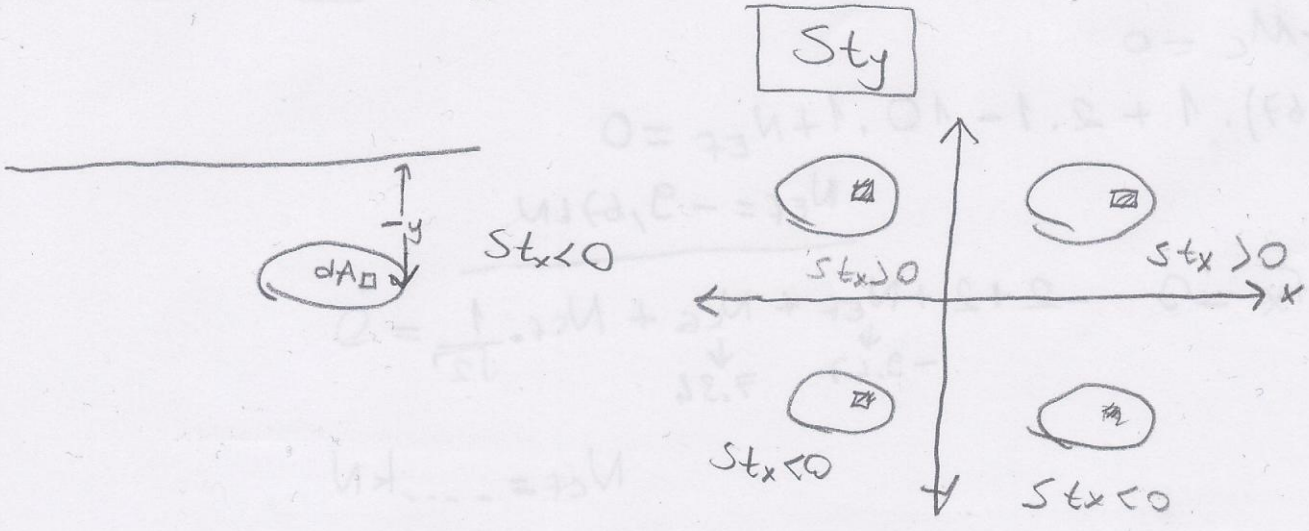
$5 \cdot 2 + 8\,(2,5) - N_{AG} \cdot 2 = 0$

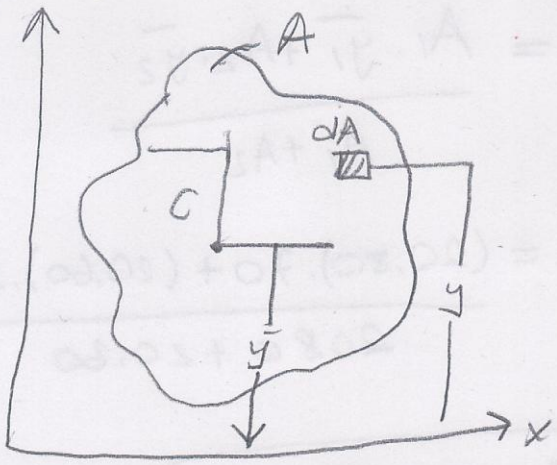
$\boxed{N_{AG} = 15\,kN}$

Düzlemsel Alanların Statik Momenti, Ağırlık Merkezleri, Atalet Momentleri



St_x = Alanın Statik Momenti



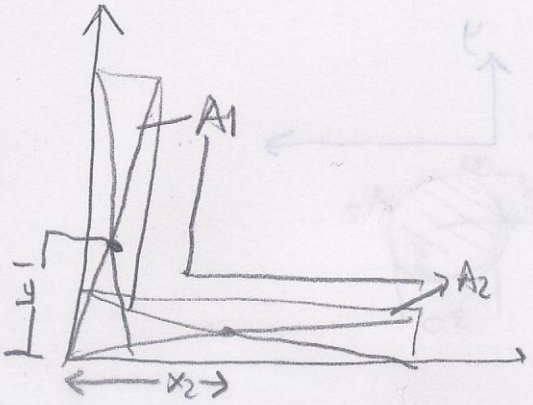


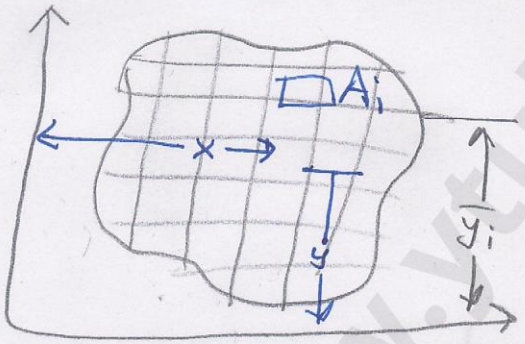
$$St_x = \int y \cdot dA = A\bar{y} \Rightarrow \boxed{\bar{y} = \frac{\int y \cdot dA}{\int dA}}$$

$$dSt_x = y\,dA$$

$$St_y = \int x \cdot dA = A \cdot \bar{x} \Rightarrow \boxed{\bar{x} = \frac{\int x \cdot dA}{\int dA}}$$

$$dSt_y = x \cdot dA$$





$$St_x = \sum_{i=1}^{n} A_i \cdot \bar{y}_i$$

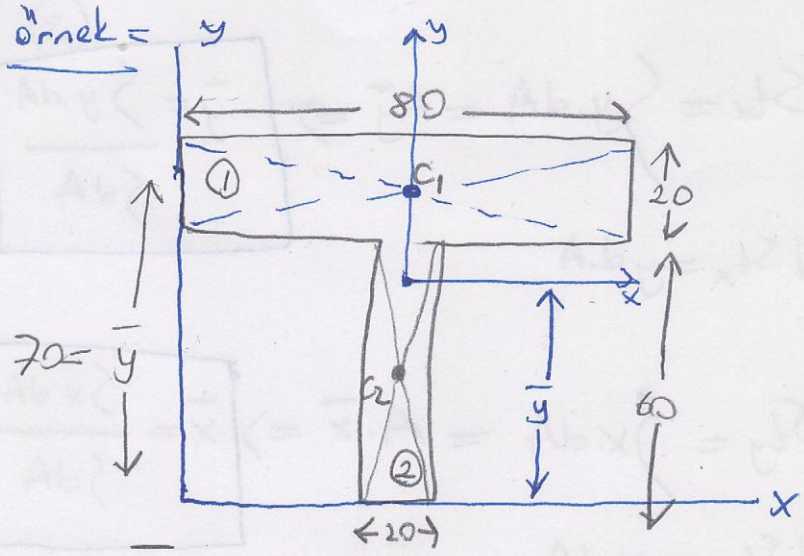
$$A = \sum_{i=1}^{n} A_i$$

$$\bar{y} = \frac{\sum_{i=1}^{n} A_i \cdot \bar{y}_i}{\sum_{i=1}^{n} A_i}$$

$$St_y = \sum_{i=1}^{n} A_{ix} \cdot \bar{x}_1$$

$$\bar{x} = \frac{\sum_{i=1}^{n} A_i \cdot \bar{x}_1}{\sum_{i=1}^{n} A_i}$$

Örnek =

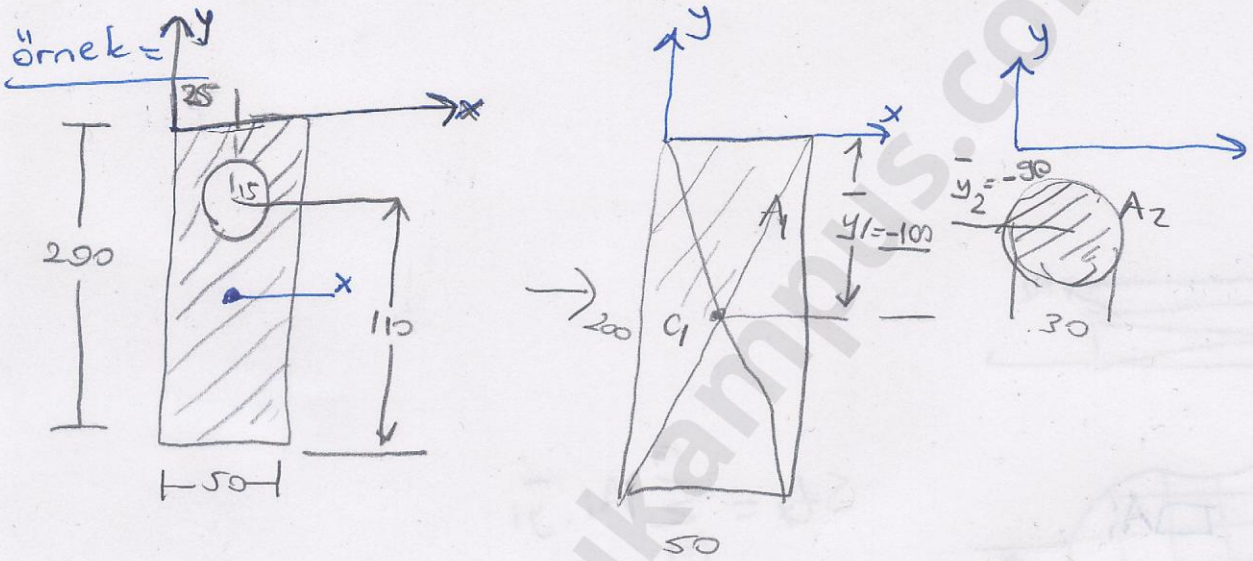


$$\bar{y} = \frac{A_1 \cdot \bar{y}_1 + A_2 \cdot \bar{y}_2}{A_1 + A_2}$$

$$= \frac{(20.80).70 + (20.60).30}{2080 + 20.60}$$

$$\bar{y} = 52,86 \text{ mm}$$

Örnek =



$$\bar{y} = \frac{A_1 \cdot \bar{y}_1 - A_2 \cdot \bar{y}_2}{A_1 - A_2}$$

$$= \frac{(50.200) \cdot (-100) - (\pi r^2)(-90)}{(50.200) - (\pi . 15^2)}$$

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