



Σχολίο Μηχανική Περιβάλλοντος
Τίτλος Μαθήματος: Στατική
Εξέταση Περιόδου: Δεκέμβριος
Ημερομηνία: 15/12/20

Ονοματεπώνυμο: Θεοχάρη Κυριακή

Αριθμός Μητρώου: 2018050043

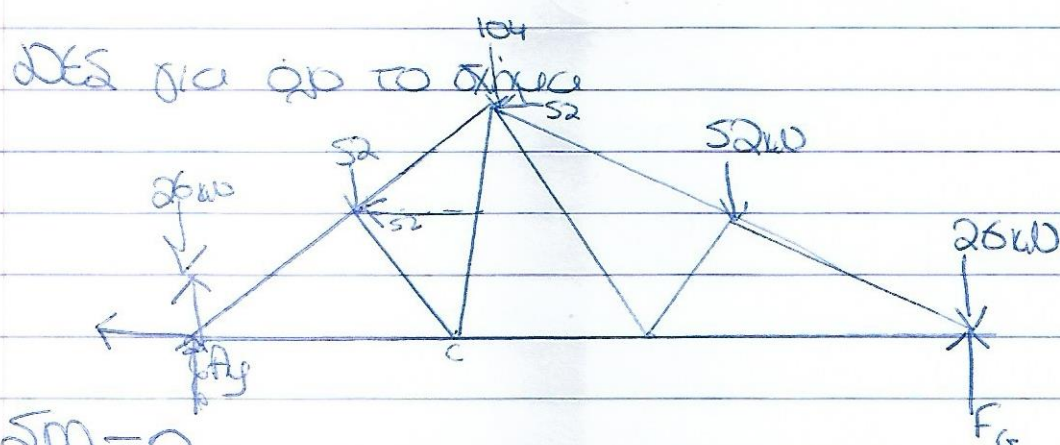
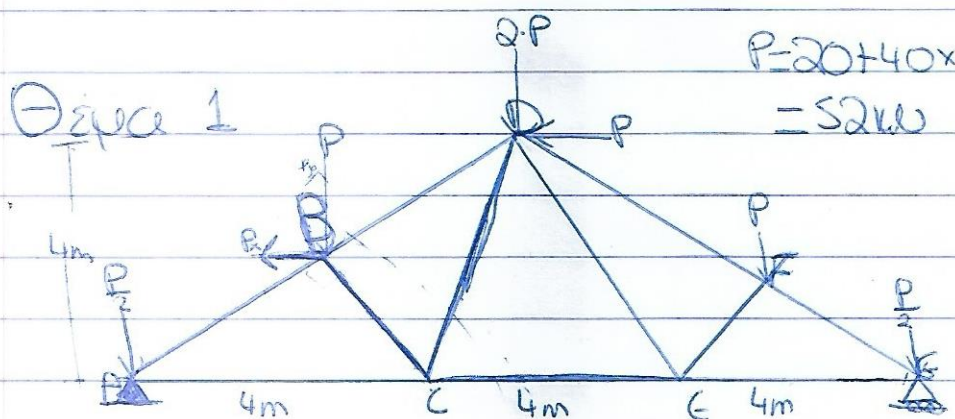
Breakout Room: 8

Εργαστήριο: Παραδομένα από το γραφείο του Μ410 τον 2018/9

Δεδομένα για άσκηση 8

$$x = 0,8$$

$$y = 0,8$$



$$\sum M_G = 0$$

$$52 \cdot 4 + 104 \cdot 8 + 52 \cdot 12 + 26 \cdot 12 - A_y \cdot 12 = 0$$

$$208 + 832 + 624 + 312 - A_y \cdot 12 = 0$$

$$1576 = 12 A_y$$

$$(A_y = 131,33 \text{ kN})$$

$$\begin{aligned} \sum F_y &= 0 \\ -A_y + 26 + 52 + 104 + 52 + 26 - F_c &= 0 \\ -112.67 + 260 - F_c &= 0 \\ F_c &= 147.33 \text{ kN} \end{aligned}$$

$$\begin{aligned} \sum F_x &= 0 \\ A_x + 52 + 52 &= 0 \\ A_x &= -104 \text{ kN} \end{aligned}$$

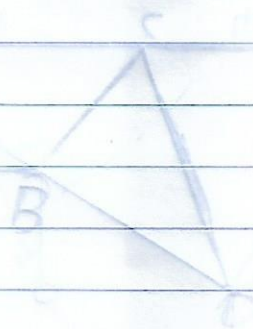
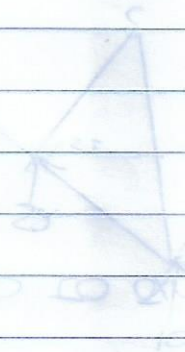
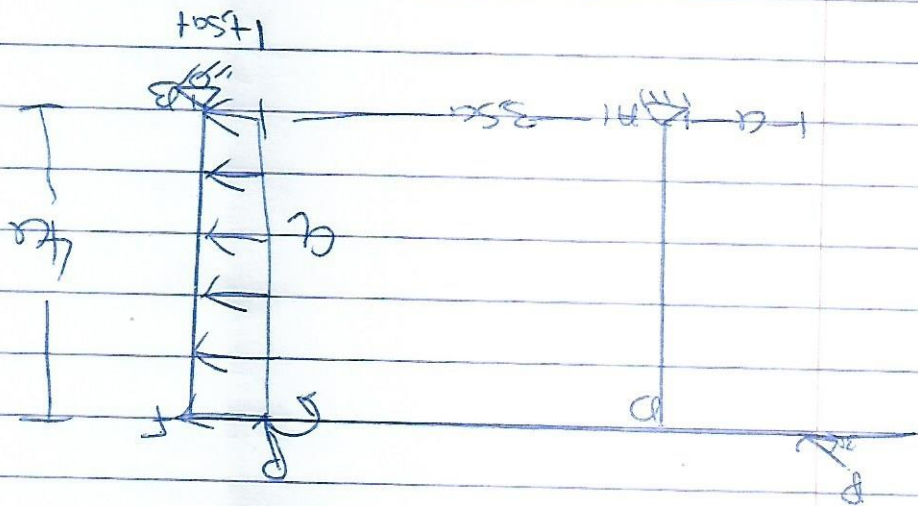
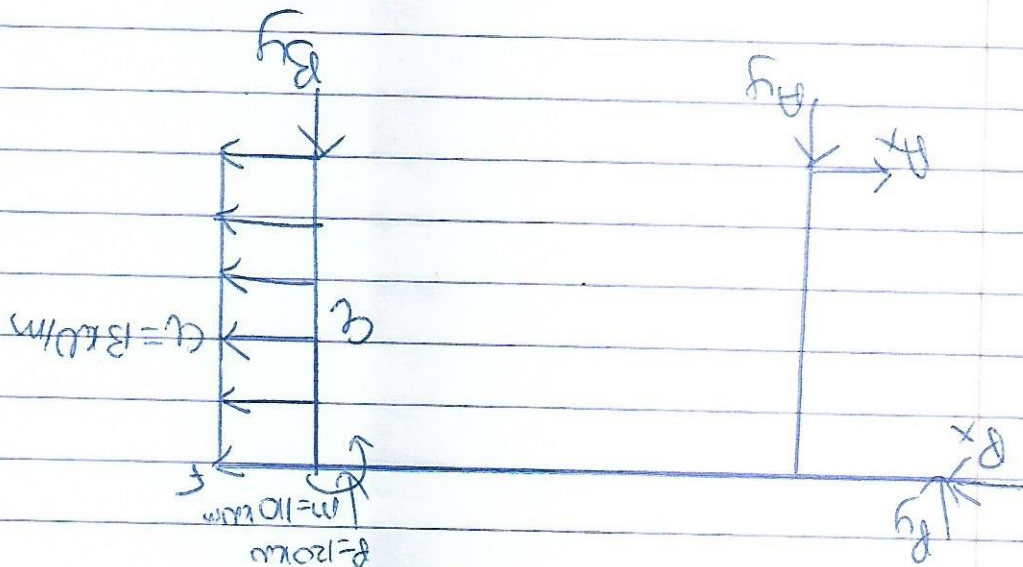


Diagram 1



$l = 4m$
 $q = 15 \times 4 = 60 kN$
 $P = 60 + 100 = 160 kN$
 $M = 30 + 100 \times 4 = 430 kNm$

does it go to support?



$M = 30 + 100 \times 3 = 330 kNm$
 $= 30 + (100 \times 0.8) = 110 kNm$
 $q = 5 + 10 \times 3 = 35 kN/m$
 $P = 35 + 100 = 135 kN$
 $F_y = 13.4$
 $= 5 + 10 \times 0.8 = 13 kN/m$

$P = 40 + 100 \times 3 = 340 kNm$
 $= 40 + 100 \times 0.8 = 120 kNm$

(1) $\sum F_x = 0$

$$R_x - A_x + H = 0$$

$$120 \cdot \cos 30^\circ - A_x + 120 = 0$$

$$-A_x = -155.9$$

$$A_x = 155.9 \text{ kN}$$

(2) $\sum F_y = 0$

$$R_y - B_y - P + B_y = 0$$

$$A_y - 120 \cdot \sin 30^\circ - 120 + B_y = 0$$

$$A_y + B_y = 60$$

(3) $\sum M_A = 0$

$$B_y \cdot 1 - R_x \cdot 4 + M - 120 \cdot 3.5 + B_y (3.5 + 1.5) = 0$$

$$120 \sin 30^\circ - (120 \cdot \cos 30^\circ \cdot 4) + 110 - (120 \cdot 3.5) + 5B_y = 0$$

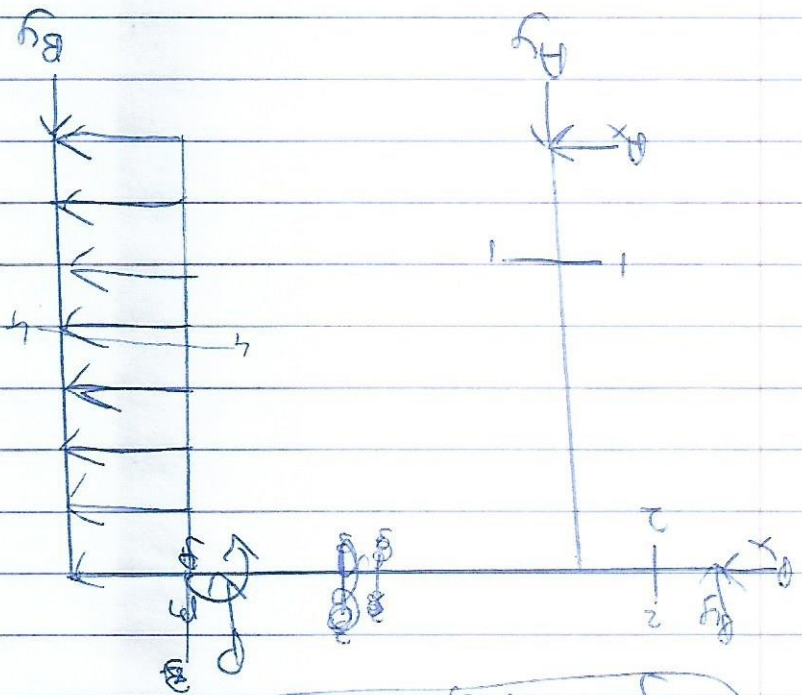
$$60 - 415.69 + 110 - 420 + 5B_y = 0$$

$$5B_y = 665.69$$

$$B_y = 133.14 \text{ kN}$$

$A_y + 133.14 = 60$

$$A_y = -73.14 \text{ kN}$$



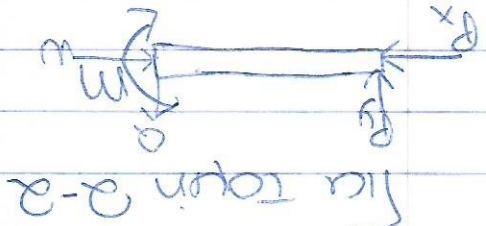
lia toyn 1-1



$$\begin{aligned} \sum M &= 0 \\ \sum F_y &= 0 \\ \sum F_x &= 0 \end{aligned}$$

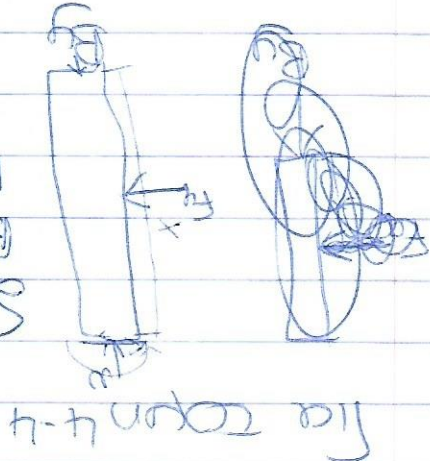
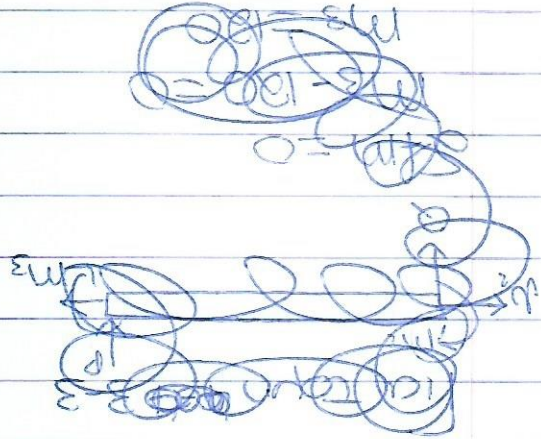
$$M = 0 \quad H_y - H_1 = 0 \quad -H_x + H_1 = 0$$

$$H_1 = 15.9 \text{ kN} \quad H_1 = 73.14 \text{ kN}$$



$$\begin{aligned} \sum M &= 0 \\ \sum F_x &= 0 \\ \sum F_y &= 0 \end{aligned}$$

$$M = 0 \quad V_x - V_1 = 0 \quad V_1 = 60.13 \text{ kN}$$



$$\begin{aligned} \sum F_y &= 0 \\ \sum F_x &= 0 \end{aligned}$$

$$H_y - H_1 = 0 \quad H_1 = 133.14$$

$$\begin{aligned} \sum F_x &= 0 \\ \sum F_y &= 0 \end{aligned}$$

$$H_x - H_1 = 0 \quad H_1 = 13 \text{ kN}$$

$$H_{max} = 58.14 \text{ kN} \quad H_{min} = 0 \text{ kN}$$

Fig. 3-3



$$\sum F_x = 0 \quad \sum M = 0$$

$$-V_2 + V_3 = 0 \quad M_2 - 120 - 110 = 0$$

$$V_3 = 60 \text{ kN} \quad M_3 = 230 \text{ kNm}$$

$$\sum F_y = 0$$

$$120 + 120 + 120 + Q = 0$$

$$Q = -180 \text{ kN}$$