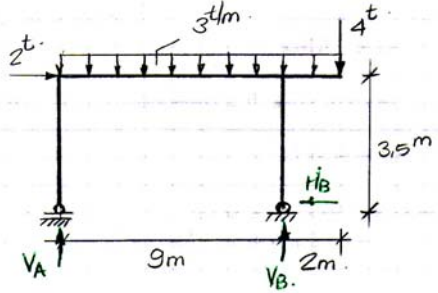


UYGULAMA 1

SORU 1:



$$\sum X = 0 \rightarrow H_B = 2$$

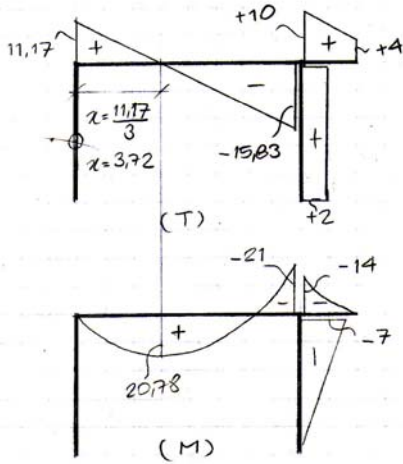
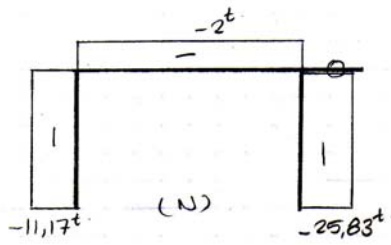
$$+\circlearrowleft \sum M_B = 0 \rightarrow 9V_A + 2 \cdot 3,5 - 3 \times 11 \times (5,5 - 2) + 4 \cdot 2 = 0$$

$$V_A = 11,17^t$$

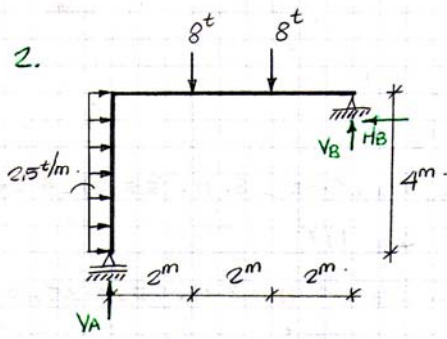
$$+\uparrow \sum M_A = 0 \rightarrow 9V_B - 4 \times 11 - 3 \times 11 \times 5,5 - 2 \cdot 3,5 = 0$$

$$V_B = 25,83^t$$

Kontrol: $\sum Y = 0 \rightarrow V_A + V_B = 4 + 3 \times 11 = 37$
 $25,83 + 11,17 = 37 \checkmark$



SORU 2:



$$\sum X = 0 \rightarrow H_B = 2.5 \cdot 4 = 10^t$$

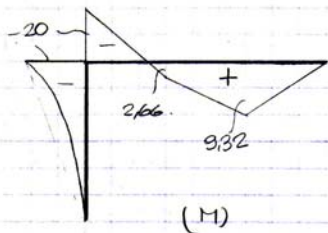
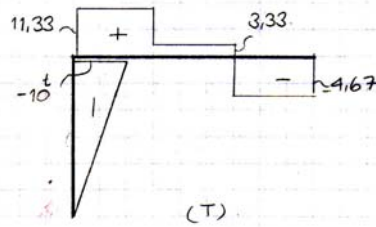
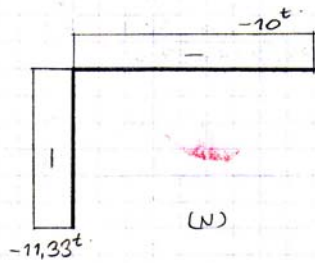
$$+\circlearrowleft \sum M_B = 0 \rightarrow 6V_A - 2.5 \cdot 4 \cdot 2 - 8 \cdot 4 - 8 \cdot 2 = 0$$

$$V_A = 11.33^t$$

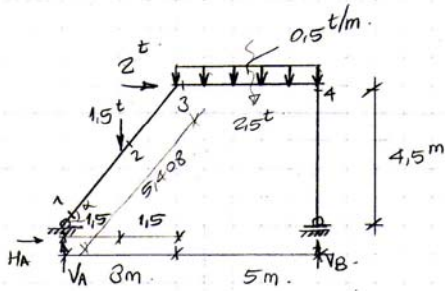
$$+\circlearrowleft \sum M_A = 0 \rightarrow 6V_B + 10 \cdot 4 - 8 \cdot 4 - 8 \cdot 2 - 2.5 \cdot 4 \cdot 2 = 0$$

$$V_B = 4.67^t$$

Kontrol: $\sum Y = 0 \rightarrow V_A + V_B \stackrel{?}{=} 8 + 8$
 $11.33 + 4.67 = 16 \quad \checkmark$



SORU 3:



$$\sum X = 0 \rightarrow H_A = -2^t$$

$$\sum M_A = 0 \rightarrow 8V_B = 2.5 + 1.5 \times 1.5$$

$$V_B = 3.125^t$$

$$\sum M_B = 0 \rightarrow 8V_A = 1.5 \times 6.5 - 2 \times 4.5 + 2.5 \times 2.5$$

$$V_A = 0.875^t$$

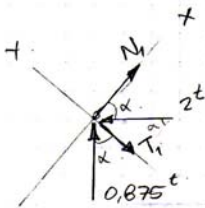
$$\sum Y = 0 \rightarrow V_A + V_B = 2.5 + 1.5 = 4^t \quad \checkmark$$

$$\sin \alpha = 0.832$$

$$\cos \alpha = 0.555$$

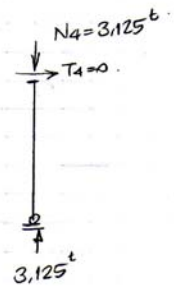
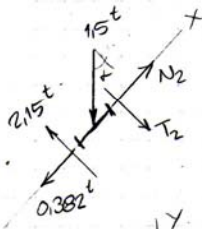
$$\sum X = 0 \rightarrow N_1 = 2 \cos \alpha - 0.875 \sin \alpha = 0.382^t$$

$$\sum Y = 0 \rightarrow T_1 = 2 \sin \alpha + 0.875 \cos \alpha = 2.15^t$$



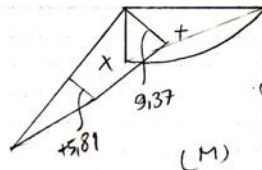
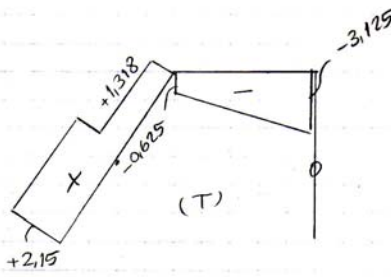
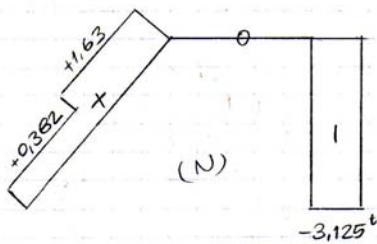
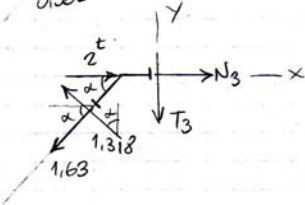
$$\sum Y = 0 \rightarrow T_2 + 1.5 \cos \alpha = 2.15 \rightarrow T_2 = 1.318^t$$

$$\sum X = 0 \rightarrow N_2 = 1.5 \sin \alpha + 0.382 = 1.63^t$$

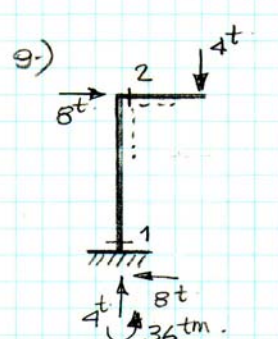


$$\sum X = 0 \rightarrow N_3 = 1.318 \sin \alpha + 1.63 \cos \alpha - 2 \approx 0$$

$$\sum Y = 0 \rightarrow T_3 = 1.318 \cos \alpha - 1.63 \sin \alpha = -0.625^t$$



SORU 4:

9-) 

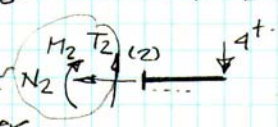
(1) kesitindeki iç kuvvetler.

Bakış yönüne göre yerleştirilen pozitif iç kuvvetler denge denklemleri ile hesaplanır.

$$\begin{aligned}\sum X=0 &\rightarrow T_1=8t \\ \sum Y=0 &\rightarrow N_1=-4t \\ \sum M_1=0 &\rightarrow M_1=-36\text{ tm.}\end{aligned}$$

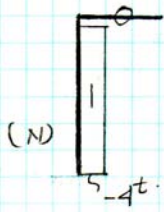
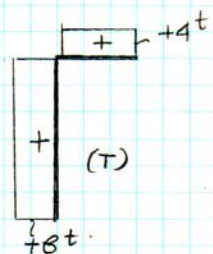
(2) kesitindeki iç kuvvetler.

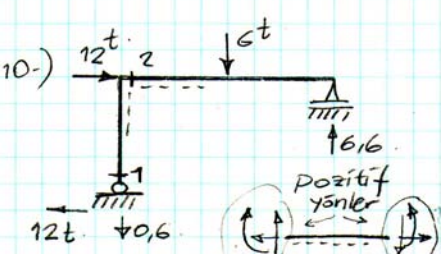
NOT: (2) kesitin sağ taraftaki parçasını almamızı nedeni daha az işlem yaparak sonuca ulaşmaktır. Sol tarafı da alsaydık aynı sonuçlara ulaşırdık.



Bakış yönüne göre pozitif iç kuvvetler

$$\begin{aligned}\sum X=0 &\rightarrow N_2=0 \\ \sum Y=0 &\rightarrow T_2=4t \\ \sum M_2=0 &\rightarrow M_2+4 \times 1=0 \rightarrow M_2=-4\text{ tm.}\end{aligned}$$

(N)  (T)  (M) 

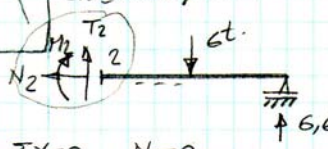
10-) 

(1) kesitindeki iç kuvvetler:

$$\begin{aligned}\sum X=0 &\rightarrow T_1=12t \\ \sum Y=0 &\rightarrow N_1=0,6t \\ \sum M_1=0 &\rightarrow M_1=0 \text{ (mafsallı mesnette moment sıfır)}\end{aligned}$$

(2) kesitindeki iç kuvvetler:

Eğer (2) kesitin sağında ki parçanın dengesini düşünseydik.



$$\begin{aligned}\sum X=0 &\rightarrow N_2=0 \\ \sum Y=0 &\rightarrow T_2=-0,6t \\ \sum M_2=0 &\rightarrow 6,6 \times 10 - 6,5 - M_2=0 \\ &\quad M_2=36\text{ tm.}\end{aligned}$$

DİKKAT SONUÇLAR AYNI

