

Example 1. The truss shown in Fig. a is loaded by an external force F . Determine the forces at the supports and in the members of the truss.

Solution:

1) numbering joints & members: $2j = m + r$.

(1) ترقيم العناصر والعقد. والتأكد من أن: $2j = m + r$

2) Completing geometric data

(2) استكمال المعطيات الجيومترية

3) Identification of zero-force members.:

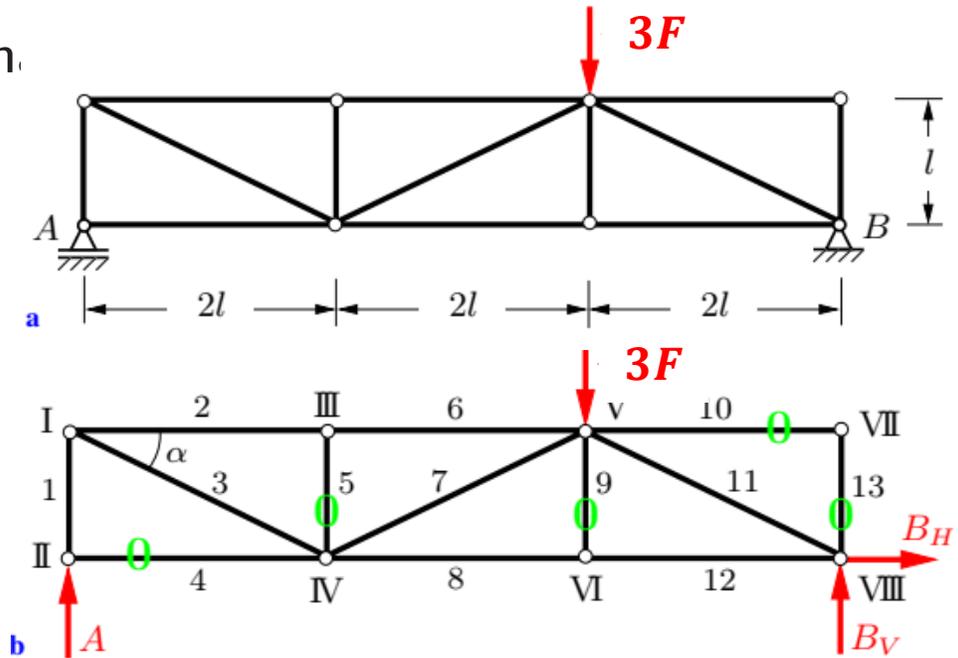
(3) التحري عن العناصر الصفرية

4) Reactions: F. B. D. of the truss

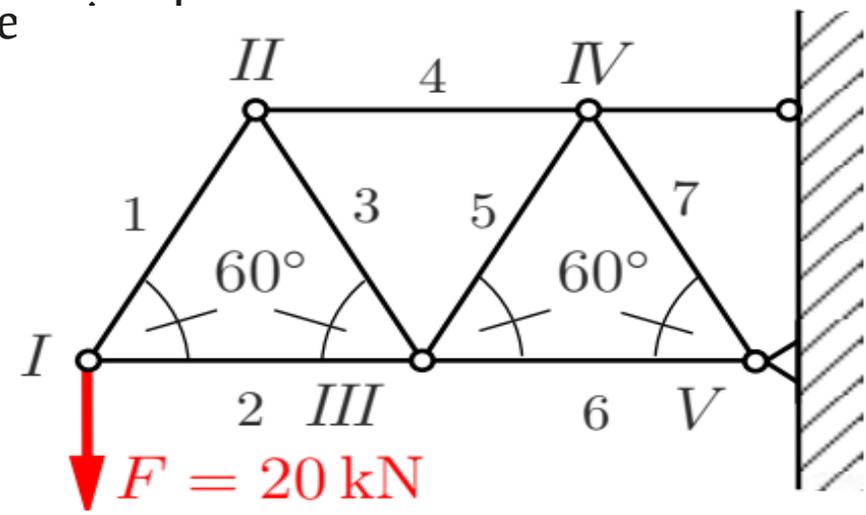
(4) حساب ردود أفعال المساند: مخطط الجسم الحر للجائز

5) Member Forces: F. B. Ds. of the joints

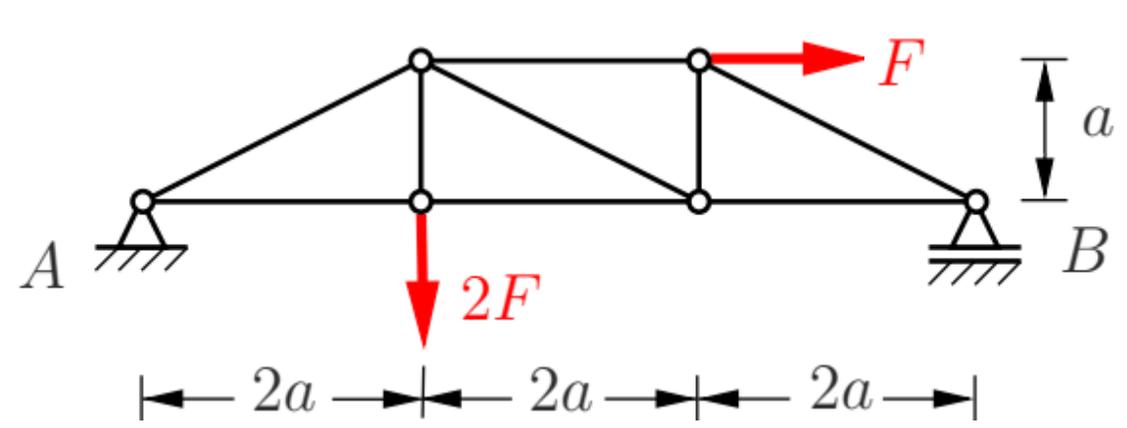
(5) حساب قوى العناصر: مخططات الجسم الحر للعقد



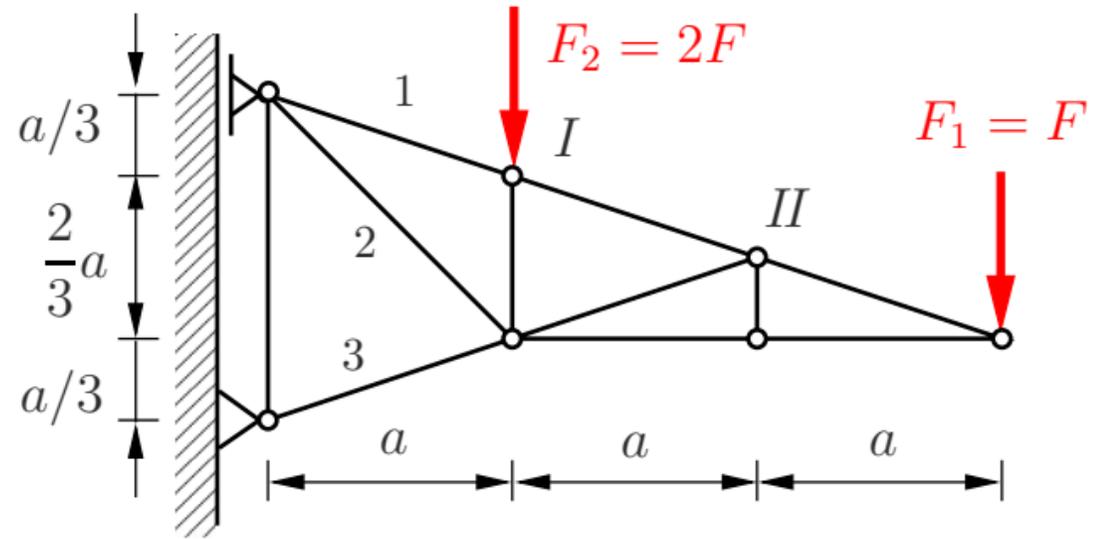
Example 2. For the given truss, all bar forces have to be dete



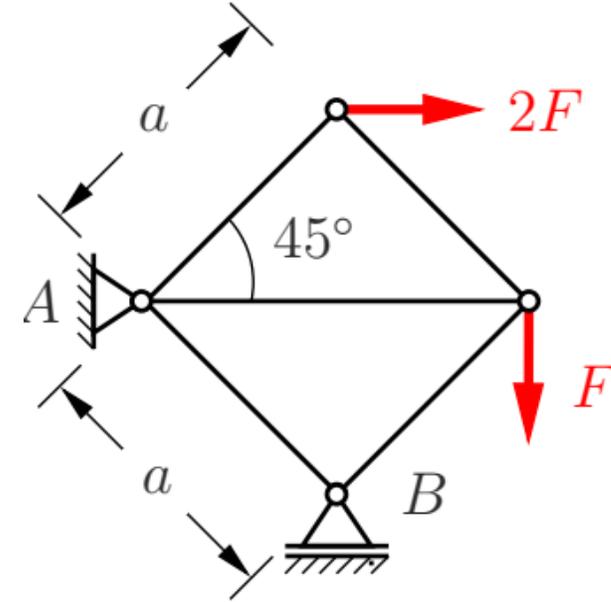
Example 3. For the given truss, the forces in the bars shall be determined. Take $F = 12 \text{ kN}$.



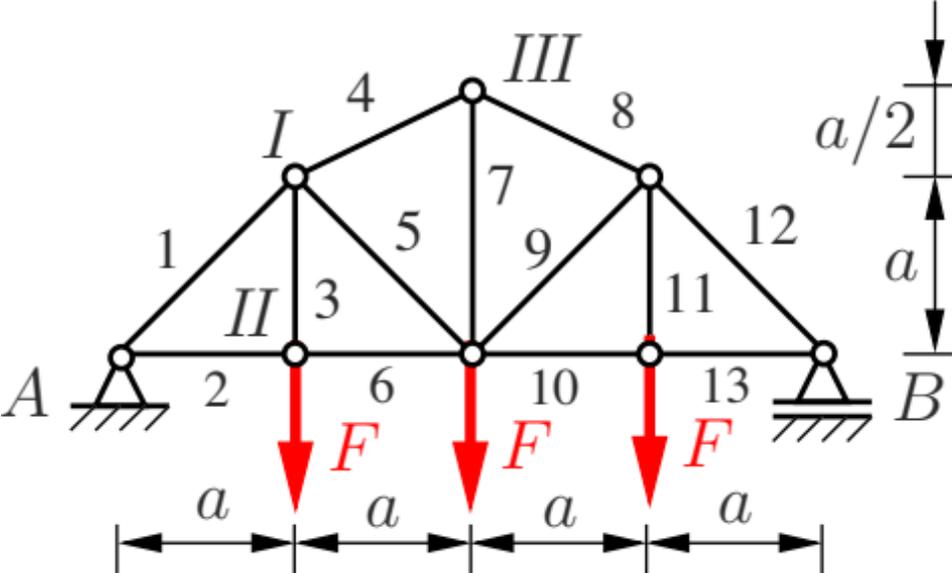
Example 4. For the given truss, the bar forces have to be determined with the Method of Joints.



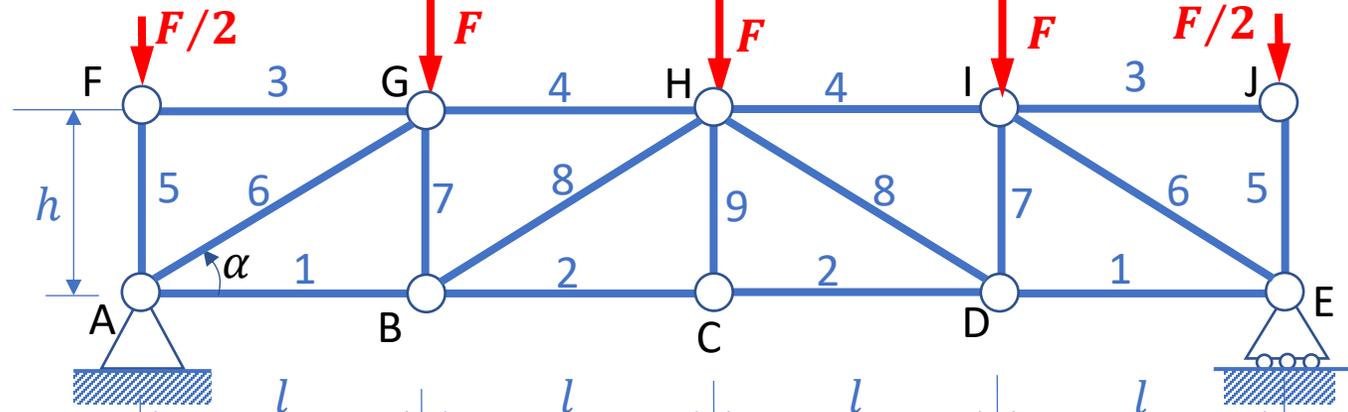
Example 5. For the given truss, the bar forces have to be determined with the Method of Joints.



Example 6. Determine the bar forces for the given truss.



Example 7. The truss shown in Fig. is loaded by external forces. Determine the forces at the supports and in the members of the truss.



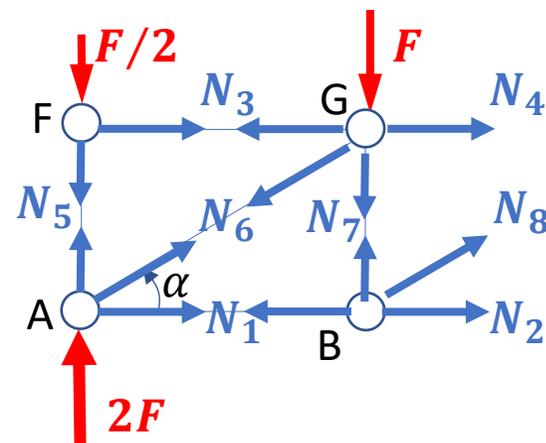
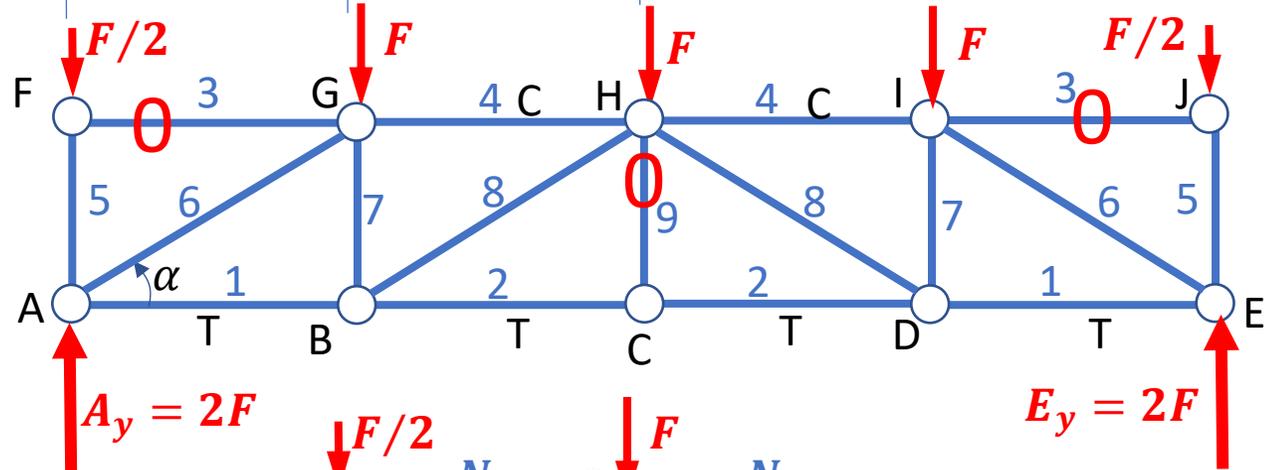
Eq. Eqs. of the truss: $A_y = E_y = 2F$

Eq. Eqs. of joint F: $N_3 = 0, N_5 = -F/2$

Eq. Eqs. of joint A: $N_6 = -\frac{3F}{2 \sin \alpha}, N_1 = +\frac{3F}{2 \tan \alpha}$

Eq. Eqs. of joint G: $N_7 = \frac{F}{2}, N_4 = -\frac{3F}{2 \tan \alpha}$

Eq. Eqs. of joint B: $N_8 = -\frac{F}{2 \sin \alpha}, N_2 = \frac{2F}{\tan \alpha}$



لا حظ أن عناصر الوتر السفلي مشدودة وعناصر الوتر العلوي مضغوطة

لا حظ أن القوى في عناصر الوترين متزايدة بالقيمة المطلقة عندما يتناقص ارتفاع الجائز وأنها تسعى إلى اللانهاية عندما يسعى الارتفاع إلى الصفر

Example 8. The truss shown in Fig. is loaded by external forces. Determine the forces at the supports and in the members of the truss.

