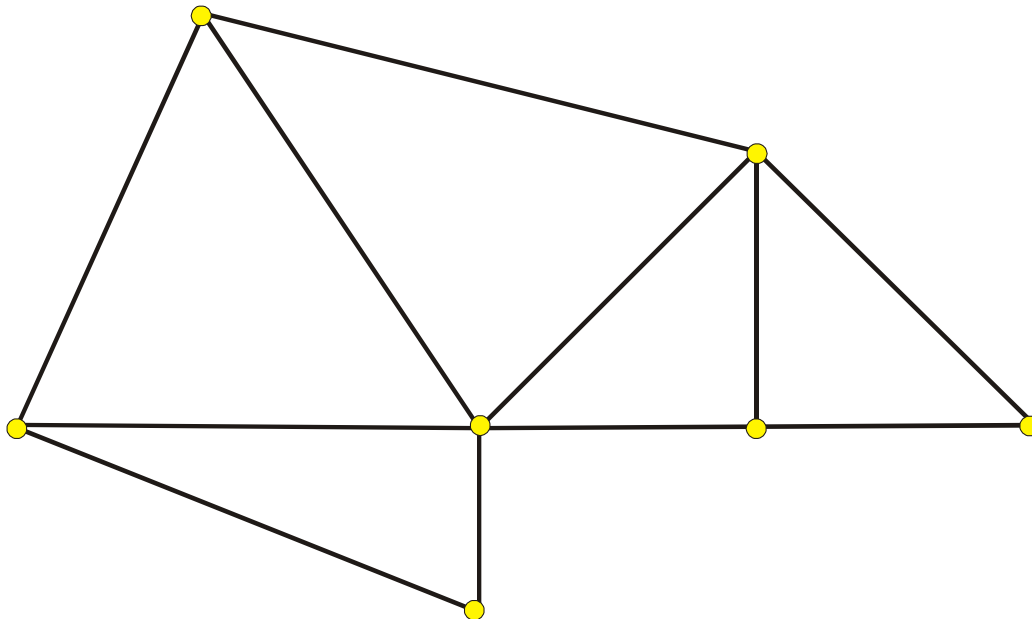
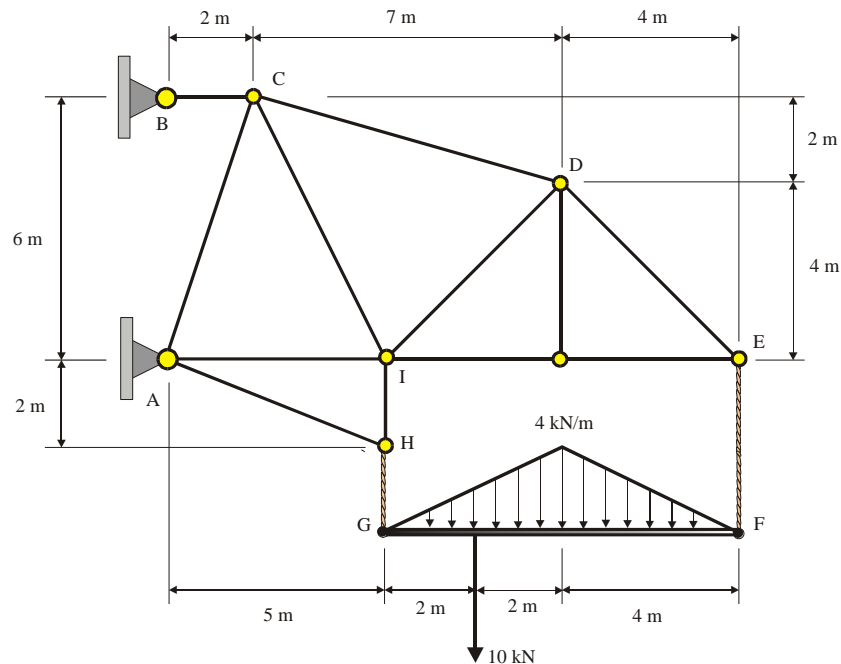
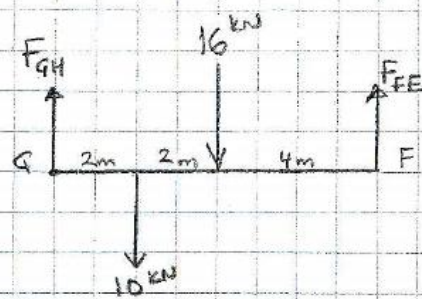


A simple truss has a hinge (pin) support at *A*. Member *BC* is a “short link”. The beam *GF* is suspended from the truss by cables attached at points *H* and *E*. The beam supports the distributed load shown and a point load of 10 kN . Determine:

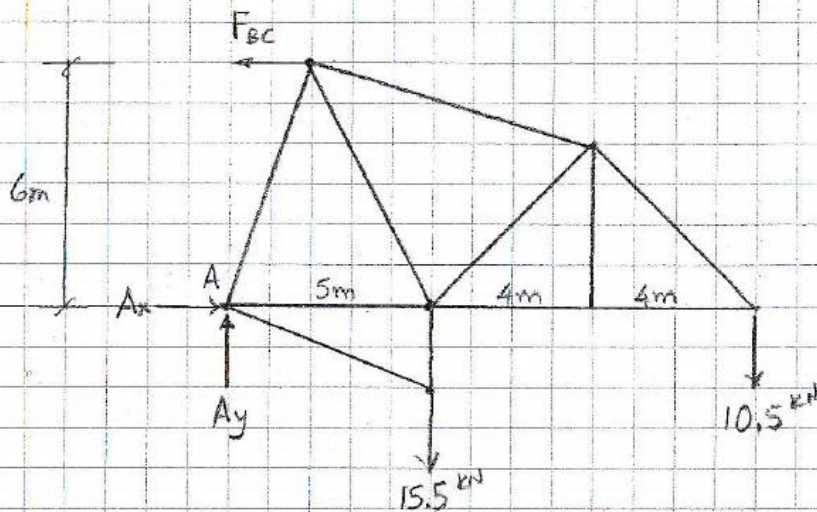
- The reactions at supports *A* and *B*,
- The tensions in cables *HG* and *EF*, and
- The force in each member of the truss and state whether the member is in tension, compression or a zero force member. **PLACE YOUR RESULTS ON THE FIGURE PROVIDED.**





$$(\sum M_G = 0) \quad -2(10) - 4(16) + 8 F_{FE} = 0 \quad F_{FE} = 10.5 \text{ kN}$$

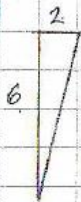
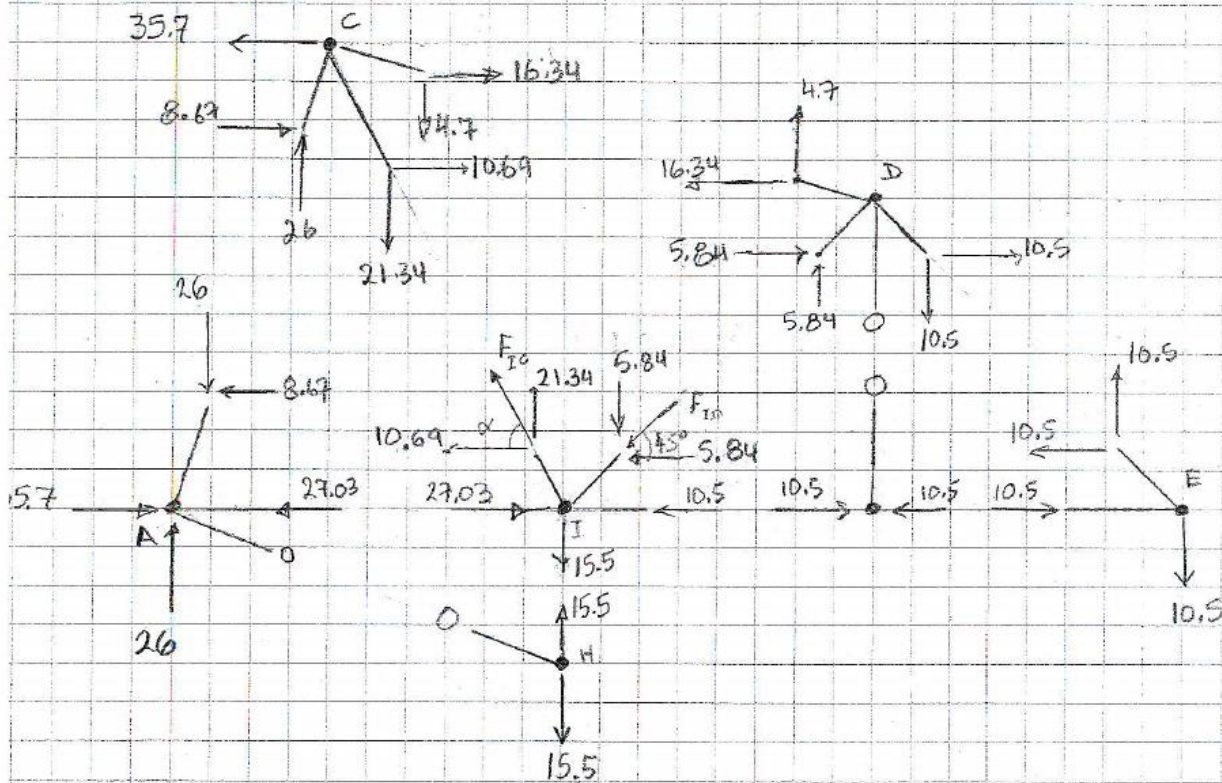
$$(\sum F_y = 0) \quad F_{GH} - 10 - 16 + F_{FE} = 0 \quad F_{GH} = 15.5 \text{ kN}$$



$$(\sum M_A = 0) \quad 6 F_{BC} - 5(15.5) - 13(10.5) = 0 \quad F_{BC} = 35.7 \text{ kN}$$

$$(\sum F_x = 0) \quad A_x - F_{BC} = 0 \quad A_x = 35.7 \text{ kN}$$

$$(\sum F_y = 0) \quad A_y - 15.5 - 10.5 = 0 \quad A_y = 26 \text{ kN}$$



$$\alpha = \tan^{-1}\left(\frac{6}{3}\right) = 63.4^\circ$$

② Joint I: $(\sum F_x = 0) \quad 27.03 + 10.5 - F_{IC} \cos \alpha - F_D \cos 45^\circ = 0$

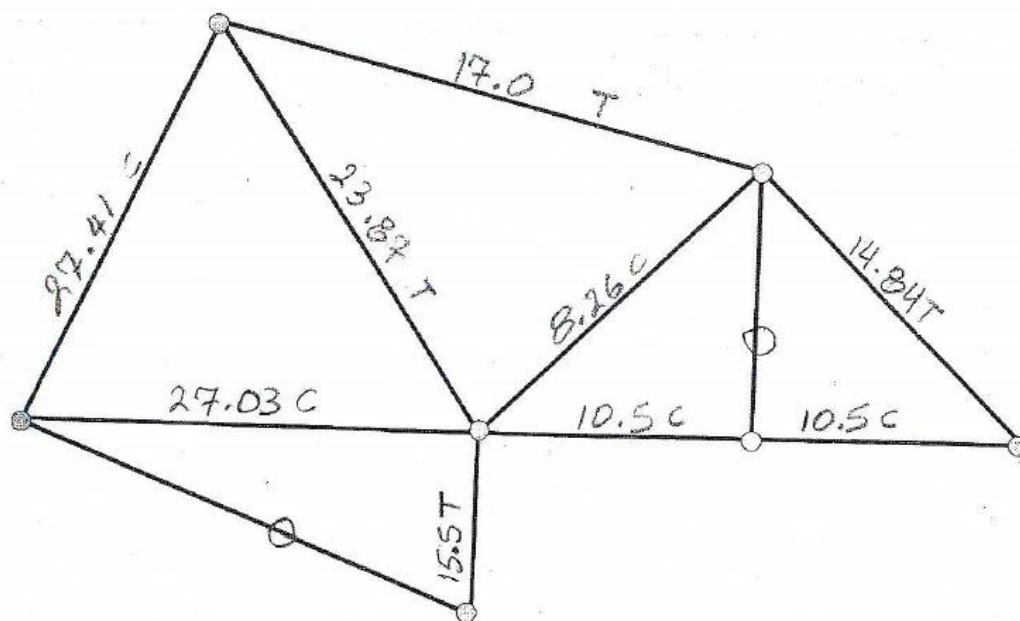
$$-0.4477 F_{IC} - 0.7071 F_{ID} = -16.53$$

$$(\sum F_y = 0) \quad -15.5 + F_{IC} \sin \alpha - F_{ID} \sin 45^\circ = 0$$

$$0.8941 F_{30} - 0.7071 F_{10} = 19.5$$

Solving $F_{IC} = 23.87 \text{ kN}$

$F_{ID} = 8.26 \text{ kN}$



(All units or kN)