

Question 1

A simple truss has a hinge (pin) support at D . Member AB is a “short link”. Two smooth pulleys each of radius 0.5 m are attached to the truss at joints F and I respectively. A cable passes over the pulleys and is attached to an external support at E . A 50 kN weight is suspended from the other end of the cable.

Determine:

Determine 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 Figure 1b.)

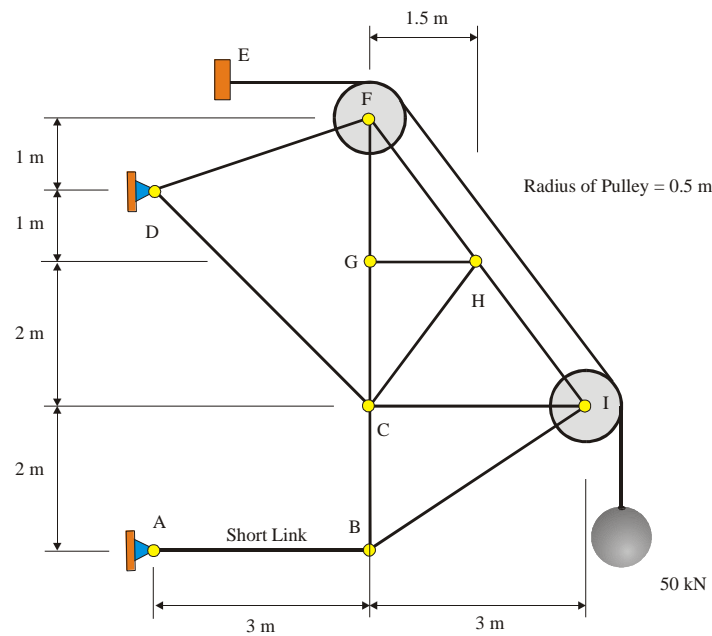


Figure 1a

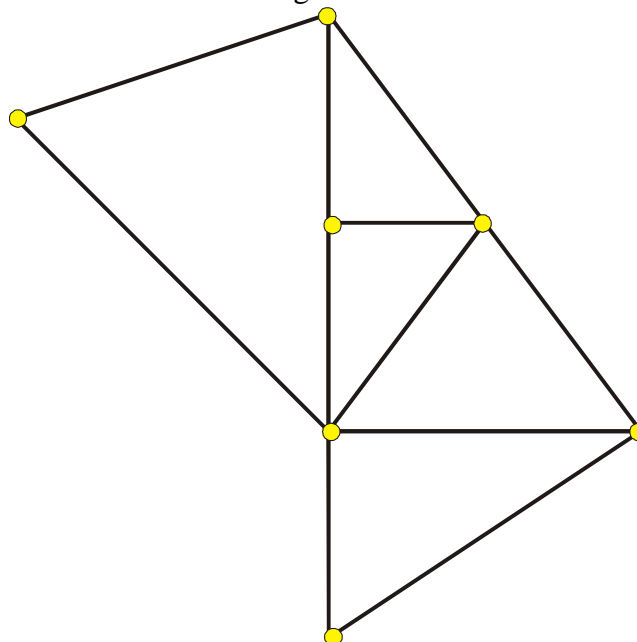


Figure 1b

Question 2

The truss shown in Figure A below is supported by a pin (hinge) support at *A* and a short link *GI*. A beam is supported by rollers at joint *C* and joint *E* of the truss. The beam support a distributed load as shown. The weight of the beam itself may be neglected. Determine the force in each member of the truss and **indicate** if the member is in tension or compression.

Show your results including the reactions on Figure 2b.

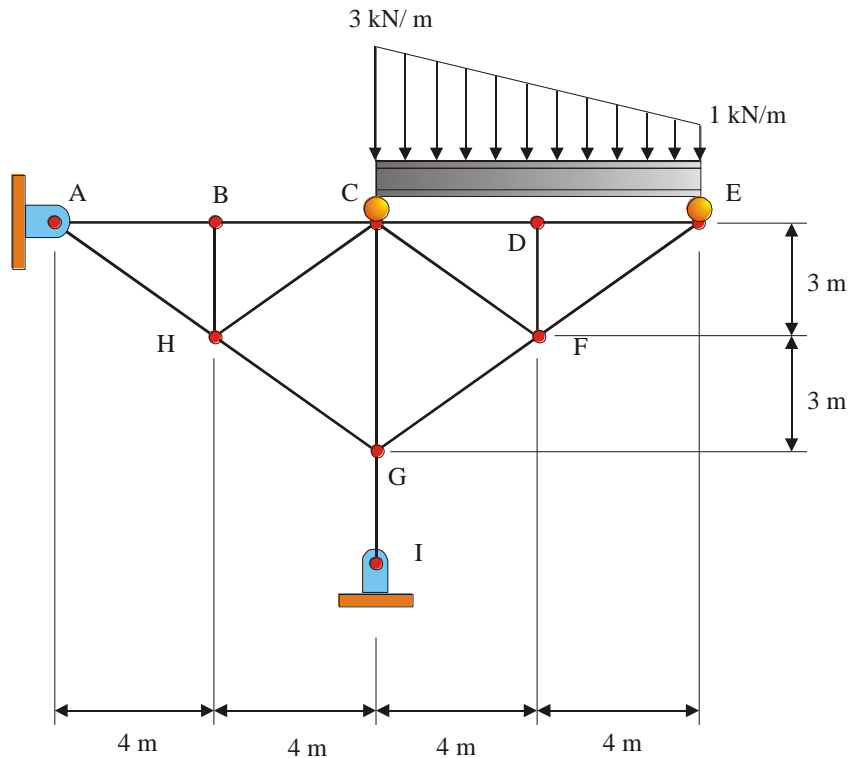


Figure 2

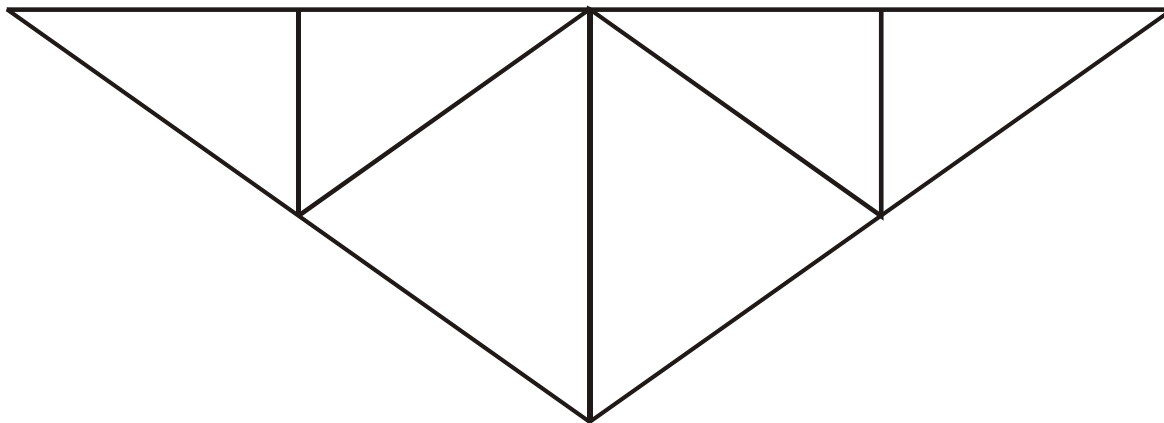


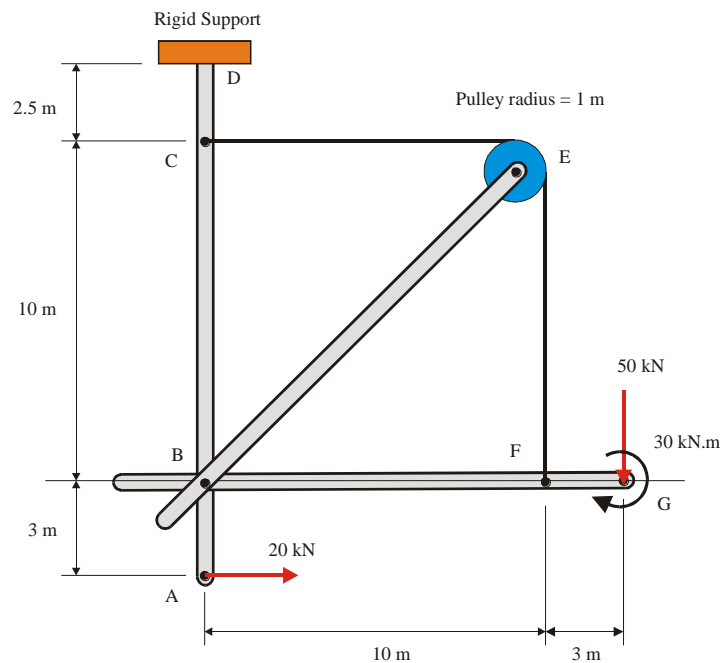
Figure 2b

Question 3.

Three members of a frame supported by a rigid (fixed) external support at D are connected by a common pin at B . A 1 m radius smooth pulley is attached to member BE of the frame. A cable passes over this pulley and is attached to the frame at C and F . Forces of 20 kN and 50 kN are applied at points A and G respectively. A 30 kN.m clockwise couple moment is applied at the end of member BFG .

Determine:

- The external reactions at support D ,
- The forces acting on each member of the frame including the pulley. **Indicate your final results on separate Free Body Diagrams of each member of the frame.**

**Figure 3**

Question 4

A 0.5 m radius pulley and a 0.1 m radius pulley are attached to the frame shown in Figure 4 below. A 250 kN weight is attached to a cable that passes over the 0.5 m radius pulley and is attached back to the frame at G . A 150 kN weight is attached to a cable that passes over the 0.1 m radius pulley and is attached back to the wall at H .

Determine the forces exerted on all members of the frame including the two pulleys.

Indicate your final results on separate Free Body Diagrams of each member of the frame.

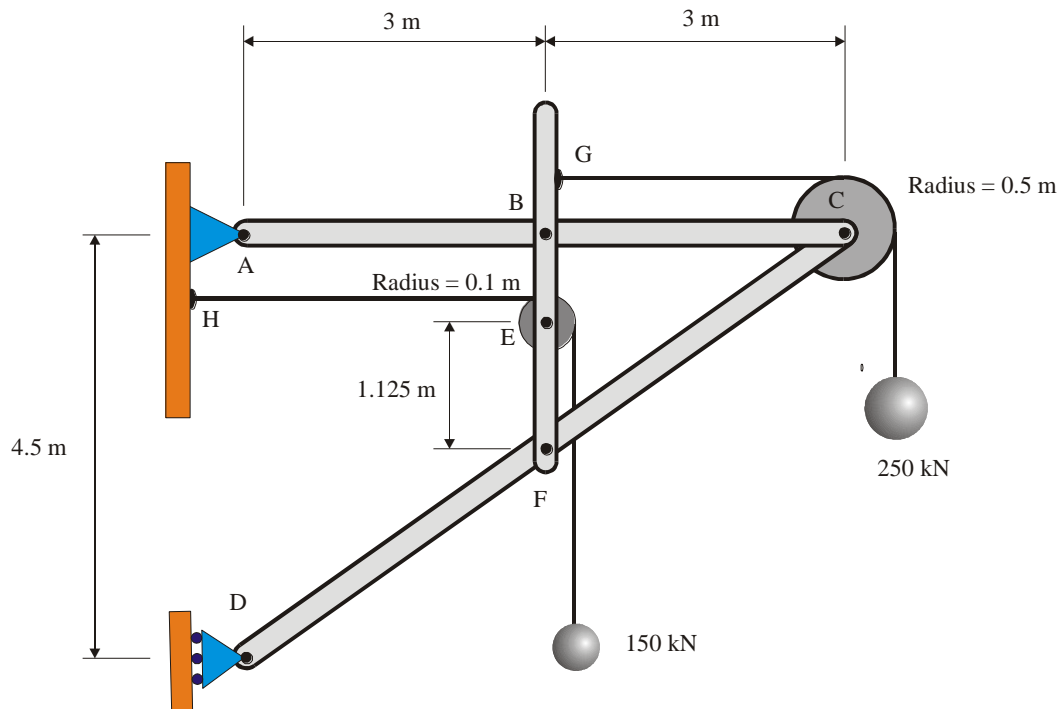


Figure 4