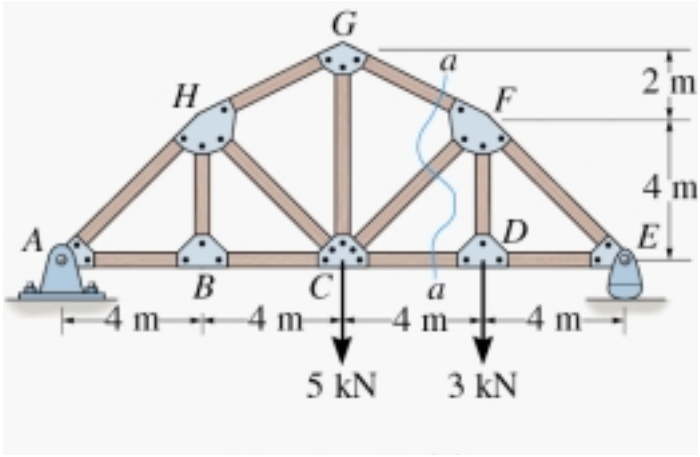
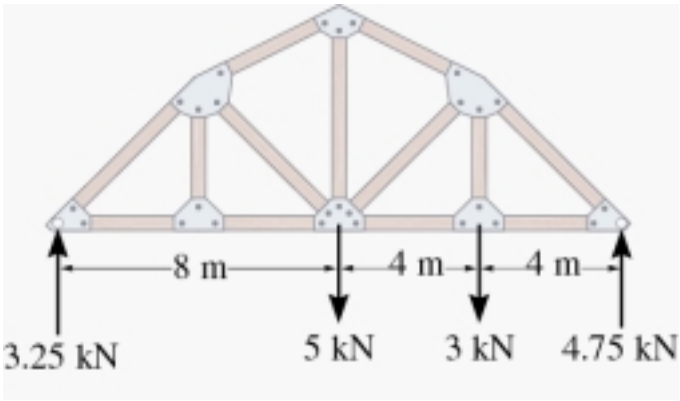
Problem 1:

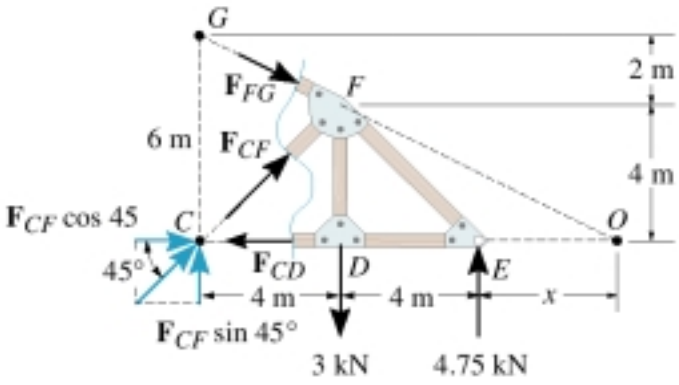
In the following Bowstring Truss, find the force in member CF.



Solution:

We draw the FBD and find the support reactions which are shown below (try to find the forces by yourself):





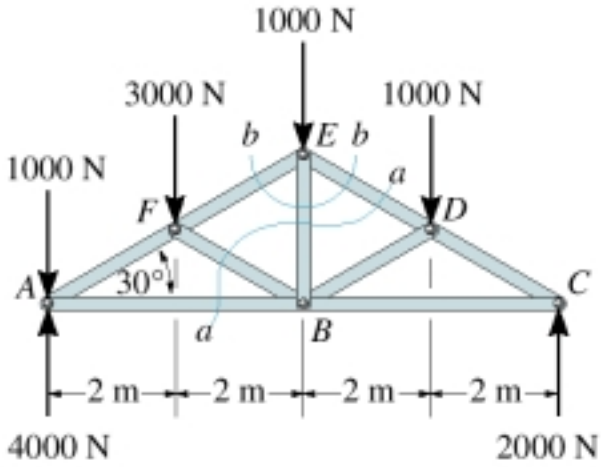
$$\sum \mathbf{M}_O = \mathbf{0}$$

$$-\mathbf{F}_{CF}\sin 45^\circ(12\,\mathbf{m}) + (3\,\mathbf{kN})(8\,\mathbf{m}) - (4.75\,\mathbf{kN})(4\,\mathbf{m}) = \mathbf{0}$$

$$\mathbf{F}_{CF} = \mathbf{0.589\,kN}\,(\mathbf{C})$$

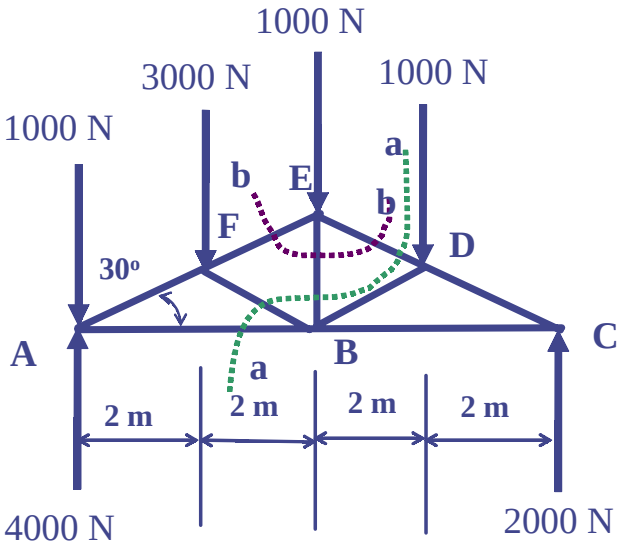
Problem 2:

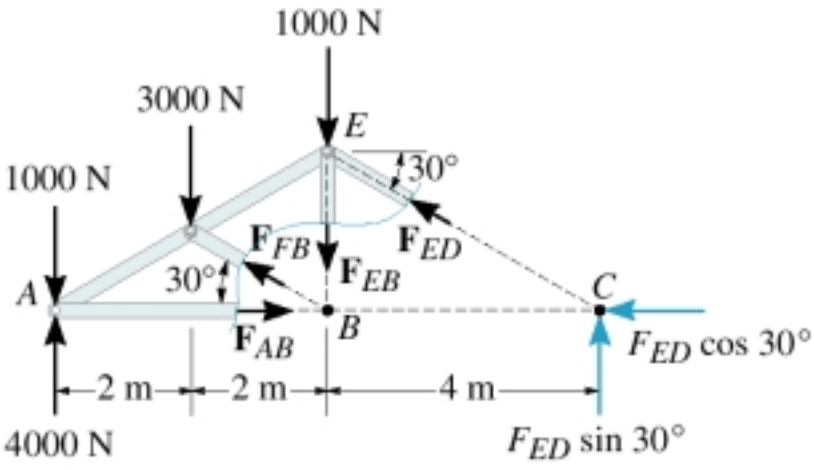
In the following truss, find the force in member EB.



Solution:

Notice that no single cut will provide the answer. Hence, we consider section a-a and b-b.





$$\sum M_B = 0$$

$$1000(4) + 3000(2) - 4000(4)$$

$$-F_{ED} \sin 30^o \ (4) = 0$$

$$F_{ED} = -3000 \ \text{N}$$

$$F_{ED} = 3000 \ \text{N} \ \ (C)$$

$$\sum F_x = 0$$

$$-F_{EF}\cos 30^o - 3000\cos 30^o = 0$$

$$F_{EF} = -3000 \quad \text{N}$$

$$F_{EF} = 3000 \quad \text{N} \quad \text{(C)}$$

$$\sum F_y = 0$$

$$-F_{EF}\sin 30^o - 3000\sin 30^o - 1000 - F_{EB} = 0$$

$$F_{EB} = 2000 \quad \text{N} \quad \text{(T)}$$