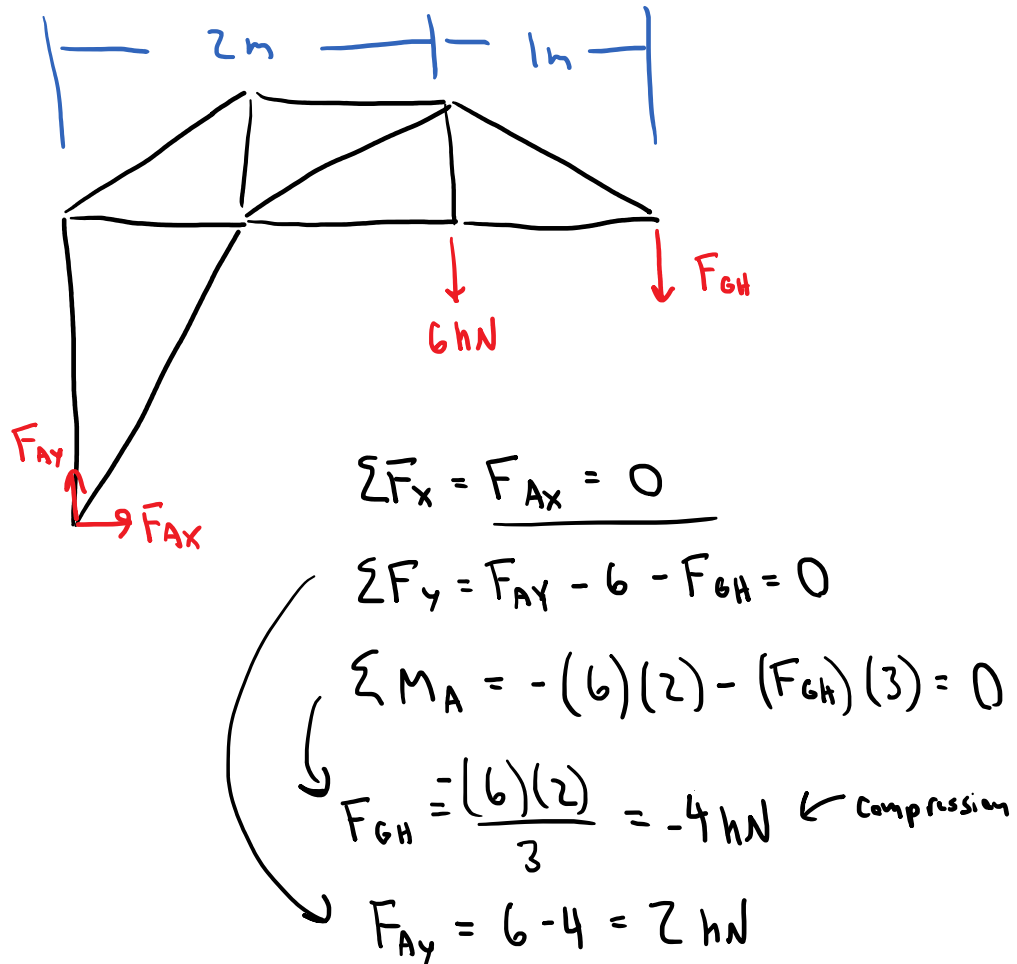
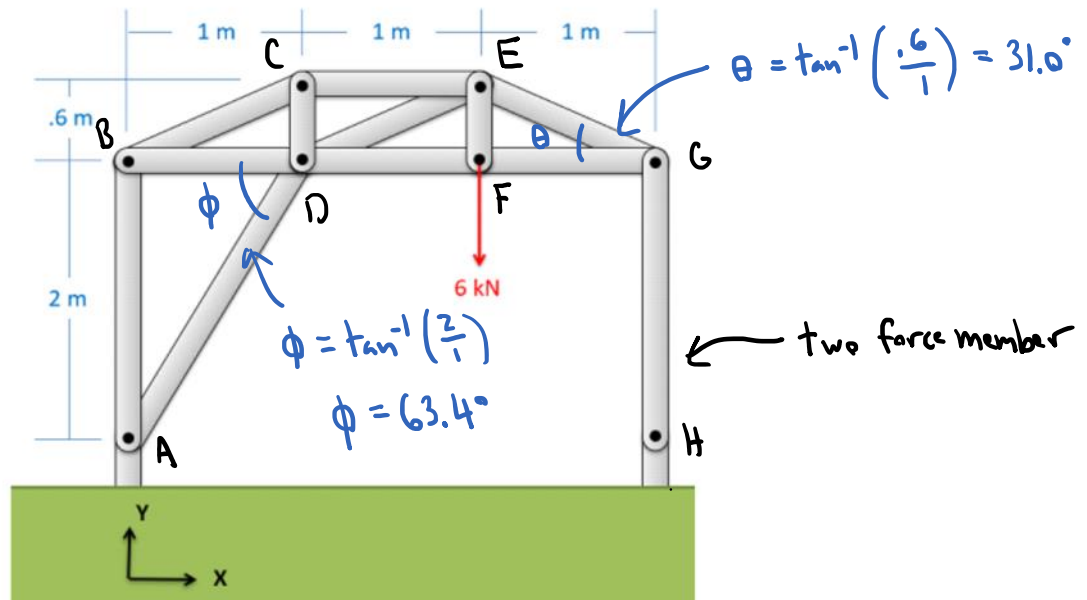
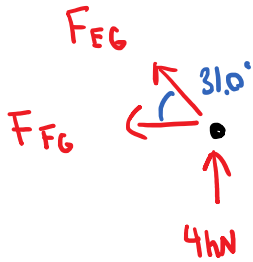


### Question 3:

Use the method of joints to find the forces in all members of the truss shown below. Remember to specify tension or compression.



Point G



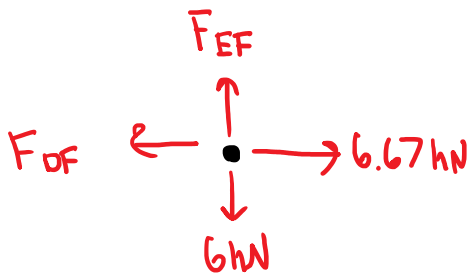
$$\sum F_x = -F_{FG} - F_{EG} \cos(31.0) = 0$$

$$\sum F_y = F_{EG} \cos(31.0) + 4 = 0$$

$$F_{EG} = -7.77 \text{ kN} \leftarrow \text{comp}$$

$$F_{FG} = 6.67 \text{ kN} \leftarrow \text{tens}$$

Point F



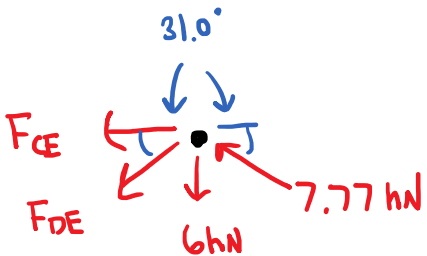
$$\sum F_x = -F_{DF} + 6.67 = 0$$

$$F_{DF} = 6.67 \text{ kN} \leftarrow \text{tens}$$

$$\sum F_y = F_{EF} - 6 = 0$$

$$F_{EF} = 6 \text{ kN} \leftarrow \text{tens}$$

Point E



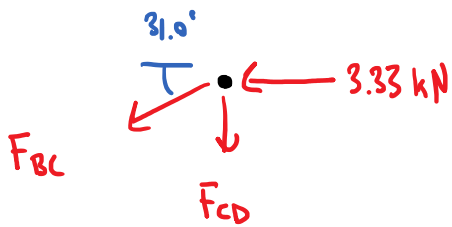
$$\sum F_x = -F_{CE} - F_{DE} \cos(31.0) - 7.77 \cos(31.0) = 0$$

$$\sum F_y = -F_{DE} \sin(31.0) - 6 + 7.77 \sin(31.0) = 0$$

$$F_{DE} = -3.89 \text{ kN} \leftarrow \text{comp}$$

$$F_{CE} = -3.33 \leftarrow \text{comp}$$

Point C



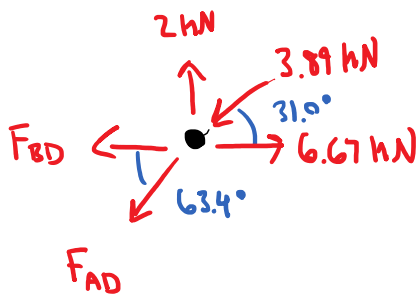
$$\sum F_x = -F_{BC} \cos(31.0) - 3.33 = 0$$

$$\sum F_y = -F_{BC} \sin(31.0) - F_{CD} = 0$$

$$F_{BC} = -3.89 \text{ kN} \leftarrow \text{comp}$$

$$F_{CD} = 2 \text{ kN} \leftarrow \text{tens}$$

Point D



$$\sum F_x = -3.89 \cos(31.0) + 6.67 - F_{BD} - F_{AD} \cos(63.4) = 0$$

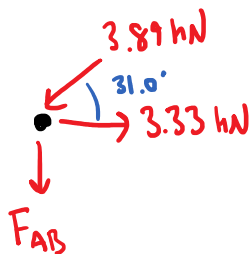
$$-F_{AD} \cos(63.4) = 0$$

$$\sum F_y = 2 - 3.89 \sin(31.0) - F_{AD} \sin(63.4) = 0$$

$$F_{AD} = 0$$

$$F_{BD} = 3.33 \text{ kN} \leftarrow \text{tens}$$

Point B



$$\sum F_y = -3.89 \sin(31.0) - F_{AB} = 0$$

$$F_{AB} = -2 \text{ kN} \leftarrow \text{comp}$$

Solution

$$F_{AB} = 2 \text{ kN C} \quad F_{BD} = 3.33 \text{ kN T} \quad F_{DE} = 3.89 \text{ kN C} \quad F_{EG} = 7.77 \text{ kN C}$$

$$F_{AD} = 0 \quad F_{CD} = 2 \text{ kN T} \quad F_{DF} = 6.67 \text{ kN T} \quad F_{FG} = 6.67 \text{ kN T}$$

$$F_{BC} = 3.89 \text{ kN C} \quad F_{CE} = 3.33 \text{ kN C} \quad F_{EF} = 6 \text{ kN T} \quad F_{GH} = 4 \text{ kN C}$$