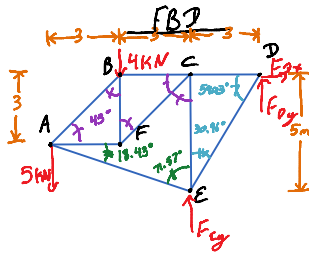
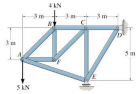


3. Determine the force in each member of the truss and state if the members are in tension or compression.



$$\sum M_D = 0 = F_{Ey}(3) - 4(6) - 5(9)$$

$$F_{Ey} = 23 \text{ kN}$$

$$\sum M_B = 0 = 5(3) + 23(3) + F_{Dy}(6)$$

$$F_{Dy} = -14 \text{ kN}$$

$$\sum F_x = 0 = F_{Dx}$$

FBD D



$$\sum F_y = 0 = F_D - F_{DE} \sin(59.03^\circ)$$

$$F_{DE} = -16.3266 \text{ kN}$$

$$\sum F_x = 0 = -F_{CD} - F_{DE} \cos(59.03^\circ)$$

$$F_{CD} = +9.4 \text{ kN}$$

FBD E



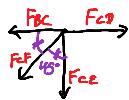
$$\sum F_x = 0 = F_{DE} \sin(30.96^\circ) - F_{AE} \sin(71.57^\circ)$$

$$F_{AE} = -8.854 \text{ kN}$$

$$\sum F_y = 0 = 23 + F_{CE} + F_{DE} \cos(30.96^\circ) + F_{AE} \cos(71.57^\circ)$$

$$F_{CE} = 6.2 \text{ kN}$$

FBD C



$$\sum F_y = 0 = -F_{CF} \sin(45^\circ) - F_{CE}$$

$$F_{CF} = -9.768 \text{ kN}$$

$$\sum F_x = 0 = F_{CD} - F_{BC} - F_{CF} \sin(45^\circ)$$

$$F_{BC} = 14.6 \text{ kN}$$

FBD B



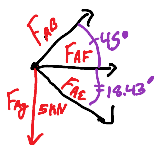
$$\sum F_x = 0 = F_{BC} - F_{AB} \sin(45^\circ)$$

$$F_{AB} = 17.138 \text{ kN}$$

$$\sum F_y = 0 = -4 \text{ kN} - F_{BF} - F_{AB} \sin(45^\circ)$$

$$F_{BF} = 18.6 \text{ kN}$$

FBD A



$$\sum F_y = 0 = F_{AB} \sin(45^\circ) - 5 \text{ kN} - F_{AE} \sin(18.43^\circ)$$

$$F_{AB} = \text{ kN}$$

$$\sum F_x = 0 = F_{AB} \sin(45^\circ) + F_{AF} + F_{AE} \cos(18.43^\circ)$$

$$F_{AB} = \text{ kN}$$

FBD F



$$\sum F_y = 0 = F_{BF} + F_{CF} \sin(45^\circ)$$

$$F_{BF} = 6.2 \text{ kN}$$

$$\sum F_x = 0 = F_{CF} \sin(45^\circ) - F_{AF}$$

$$F_{AF} = -6.2 \text{ kN}$$