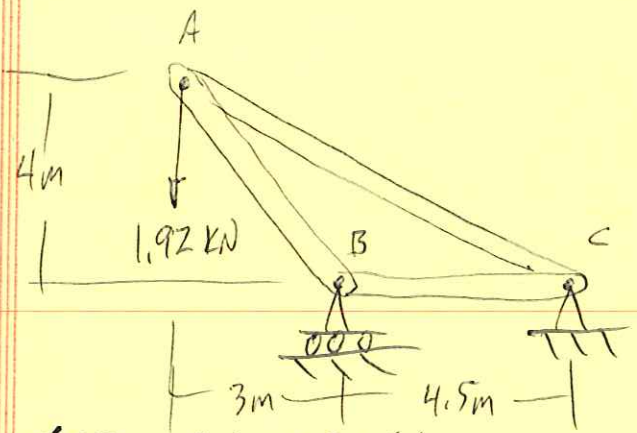
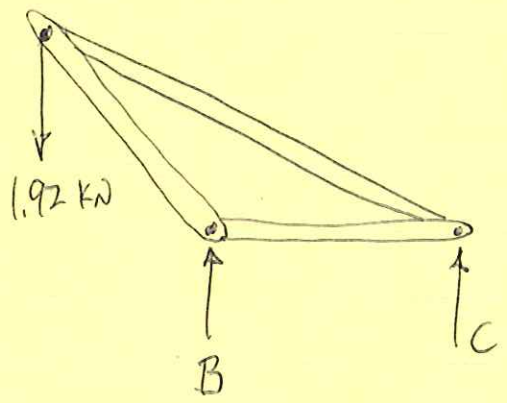


1W-CLASS #7: PROB. 6.1 Given: using Method of joints



DETERMINE FORCES.
in each member
(compression or tension)

FBD OF TRUSS:



$$\sum F_y = 0:$$

$$B + C = 1.92$$

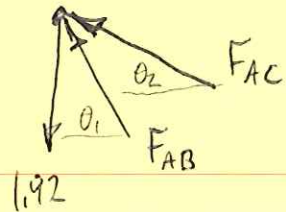
$$\sum M_c = 0 = +\curvearrowright$$

$$(7.5\text{m})(1.92\text{ kN}) - (4.5\text{m})B = 0$$

$$B = 3.2\text{ kN}$$

$$C = 1.92 - 3.2 = -1.28\text{ kN}$$

FBD OF PIN A:



FOR F_{AB} : $\theta_1 = \text{TAN}^{-1}\left(\frac{4}{3}\right) = 53.1^\circ$

$$\vec{F}_{AB} = (-\cos 53.1^\circ F_{AB}) \hat{i} + (\sin 53.1^\circ F_{AB}) \hat{j} \text{ kN}$$

$$\vec{F}_{AB} = (-0.6 F_{AB}) \hat{i} + (0.8 F_{AB}) \hat{j} \text{ kN}$$

FOR F_{AC} : $\theta_2 = \text{TAN}^{-1}\left(\frac{4}{7.5}\right) = 28.1^\circ$

$$\vec{F}_{AC} = (-\cos 28.1^\circ F_{AC}) \hat{i} + (\sin 28.1^\circ F_{AC}) \hat{j} \text{ kN}$$

$$\vec{F}_{AC} = (-0.882 F_{AC}) \hat{i} + (0.471 F_{AC}) \hat{j} \text{ kN}$$

$$\sum F_x = 0 :$$

$$-0.6 F_{AB} - 0.882 F_{AC} = 0$$

$$F_{AB} = -1.47 F_{AC} \quad \text{EQN. (1)}$$

$$\sum F_y = 0 :$$

$$-1.92 + 0.8 F_{AB} + 0.471 F_{AC} = 0 \quad \text{EQN. (2)}$$

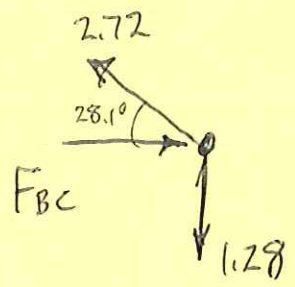
EQN. (1) INTO (2) =

$$0.8(-1.47 F_{AC}) + 0.471 F_{AC} = 1.92$$

$$F_{AC} = -2.72 \text{ kN (TENSION)}$$

$$F_{AB} = -1.47(-2.72) = 4.0 \text{ kN (COMPRESSION)}$$

FBD OF PIN C:



$$F_{BC} = 2.72 \cos 28.1^\circ = 2.4 \text{ kN (COMPRESSION)}$$

c