

14/10/22

Evaluar las fuerzas a las que están sujetos los cables del sistema que se muestra en la Fig. no.1. Calcule la tensión en cada cable.

Puntos:

$$A = (0, 0, 0)$$

$$B = (-3, 4, 8)$$

$$C = (-3, 4, 8)$$

$$D = (3, 0, 0)$$

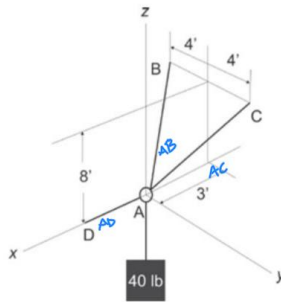


Figura 1

$$\vec{AB} = [-3, -4, 8]$$

$$\vec{AC} = [-3, 4, 8]$$

$$\vec{AD} = [3, 0, 0]$$

$$\vec{F}_{AB} = \frac{\vec{AB}}{|\vec{AB}|} = \frac{(-3\hat{i} - 4\hat{j} + 8\hat{k})}{9.43} = -0.318\hat{i} - 0.424\hat{j} + 0.848\hat{k}$$

$$\vec{F}_{AC} = \frac{\vec{AC}}{|\vec{AC}|} = \frac{(-3\hat{i} + 4\hat{j} + 8\hat{k})}{9.43} = -0.318\hat{i} + 0.424\hat{j} + 0.848\hat{k}$$

$$\vec{F}_{AD} = \frac{\vec{AD}}{|\vec{AD}|} = \frac{(3\hat{i} + 0\hat{j} + 0\hat{k})}{3} = 1\hat{i} + 0\hat{j} + 0\hat{k}$$

$$\sum F_x = 0;$$

$$-0.318 T_{AB} - 0.318 T_{AC} + 1 T_{AD} = 0$$

$$\sum F_y = 0;$$

$$-0.424 T_{AB} + 0.424 T_{AC} = 0$$

$$\sum F_z = 0;$$

$$0.848 T_{AB} + 0.848 T_{AC} = 40$$

$$T_{AB} = 23.5849 \text{ lbs}$$

$$T_{AC} = 23.5849 \text{ lbs}$$

$$T_{AD} = 15.0000 \text{ lbs}$$

} Respuestas