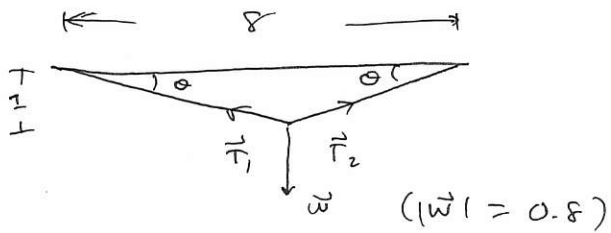


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(1)



2 Methods

$$a) \quad \theta = \tan^{-1}\left(\frac{1}{4}\right) \approx 14^\circ \quad \sin \theta = 0.24$$

$$\cos \theta = 0.97$$

$$\vec{T}_1 = -|\vec{T}_1| \cos \theta \vec{i} + |\vec{T}_1| \sin \theta \vec{j}$$

$$\vec{T}_2 = |\vec{T}_2| \cos \theta \vec{i} + |\vec{T}_2| \sin \theta \vec{j}$$

$$\vec{T}_1 + \vec{T}_2 = -\vec{w} = +0.8 \vec{j}$$

$$\text{So } 0 = (|\vec{T}_1| + |\vec{T}_2|) \cos \theta \Rightarrow |\vec{T}_1| = |\vec{T}_2|$$

$$0.8 = (|\vec{T}_1| + |\vec{T}_2|) \sin \theta = 2|\vec{T}_1| \sin \theta$$

$$\text{So } |\vec{T}_1| = \frac{0.4}{\sin \theta} = 1.653 = |\vec{T}_2|$$

$$\vec{T}_1 = -(1.653)(0.97) \vec{i} + (1.653)(0.24) \vec{j}$$

$$= -1.6 \vec{i} + .4 \vec{j}$$

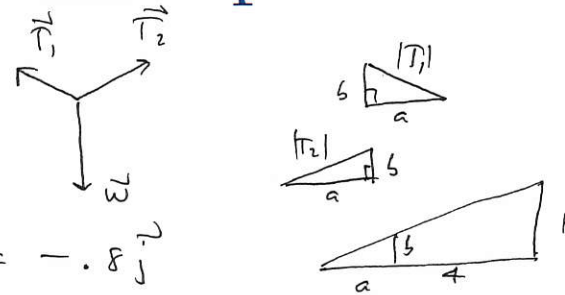
$$\vec{T}_2 = 1.6 \vec{i} + .4 \vec{j}$$

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(2)

b)



$$T_3 = -0.8 \vec{j}$$

$$T_1 = -a \vec{i} + b \vec{j}$$

$$T_2 = a \vec{i} + b \vec{j}$$

$$T_1 + T_2 = -T_3, \text{ so}$$

$$0 \vec{i} = 0 \vec{i}, \quad 2b \vec{j} = .8 \vec{j}$$

$$b = .4 \quad \frac{b}{a} = \frac{1}{4}$$

$$\text{So } a = 4b = 1.6$$

$$\vec{T}_1 = -1.6 \vec{i} + .4 \vec{j}$$

$$\vec{T}_2 = 1.6 \vec{i} + .4 \vec{j}$$

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