

$$T_{AC} = 120 \left(\frac{30}{5} i - \frac{40}{5} j + \frac{40}{5} k \right)$$

$$\boxed{T_{AC} = -40i - 80j + 80k}$$

Resultant:

$$\vec{R} = \vec{T}_{AB} + \vec{T}_{AC}$$

$$= -70.66j + 70.66k + 40i - 80j + 80k$$

$$\boxed{\vec{R} = 40i - 150.66j + 150.66k}$$

Magnitude:

$$|\vec{R}| = \sqrt{40^2 + (150.66)^2 + (150.66)^2}$$

$$\boxed{R = 216.89 \text{ N}}$$

$$R_x = R \cos \theta_x$$

$$\text{Hence } \theta_x = \cos^{-1} \left(\frac{R_x}{R} \right)$$

$$\theta_x = \cos^{-1} \left(\frac{40}{216.89} \right)$$

$$\boxed{\theta_x = 79.37^\circ}$$

Similarly, $\theta_y = \cos^{-1} \left(\frac{R_y}{R} \right)$

$$\theta_y = \cos^{-1} \left(\frac{-150.66}{216.89} \right)$$

$$\boxed{\theta_y = 133.99^\circ}$$

Similarly, $\theta_z = \cos^{-1} \left(\frac{R_z}{R} \right)$

$$\theta_z = \cos^{-1} \left(\frac{150.66}{216.89} \right)$$

$$\boxed{\theta_z = 46^\circ}$$

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