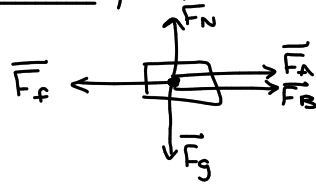


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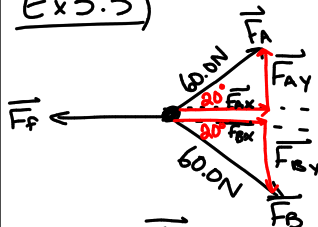
Ex 3.2) Draw free-body diagram:



NO acceleration / F_{net} vertically
SO only consider horizontal

$$\begin{aligned} \vec{F}_{net} &= \vec{F}_A + \vec{F}_B + \vec{F}_F \\ &= 60.0 + 60.0 + -85.0 \\ &= \boxed{35.0\text{N}} \text{ [forward]} \end{aligned}$$

Ex 3.3)

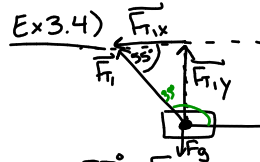


X-component

Y-component

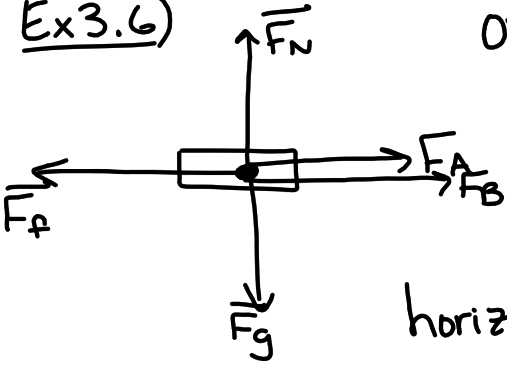
$$\begin{aligned} \vec{F}_f &= -85.0\text{N} & \vec{F}_{Ay} &= +20.52... \\ \vec{F}_{Ax} &= +56.3815... & \vec{F}_{By} &= -20.52... \\ \vec{F}_{Bx} &= +56.3815... & \text{Sum} & \\ \vec{F}_{netx} & & \vec{F}_{nety} &= 0\text{N} \\ \sin 20^\circ &= \frac{\vec{F}_{Ay}}{60.0} = 20.5212... \\ \cos 20^\circ &= \frac{\vec{F}_{Ax}}{60.0} = 56.3815... \\ \vec{F}_{netx} &= -85.0 + 56.38... + 56.38... \\ &= \boxed{27.8\text{N}} \text{ [0]} \end{aligned}$$

Ex 3.4)



$$\begin{aligned} \sin 55^\circ &= \frac{F_{T1,y}}{F_{T1}} \\ F_{T1,y} &= F_{T1} \sin 55^\circ \\ \cos 55^\circ &= \frac{F_{T1,x}}{F_{T1}} \\ F_{T1,x} &= F_{T1} \cos 55^\circ \\ \text{Sign not accelerating} &\Rightarrow \vec{F}_{net} = 0\text{N} \\ \vec{F}_{netx} &= \vec{F}_{T2} + \vec{F}_{T1,x} \leftarrow 0 = F_{T2} + -F_{T1} \cos 55^\circ \\ \vec{F}_{nety} &= \vec{F}_g + \vec{F}_{T1,y} \\ 0 &= mg + F_{T1} \sin 55^\circ \\ 0 &= (25.0)(-9.81) + F_{T1} \sin 55^\circ \\ 245.25 &= F_{T1} \sin 55^\circ \\ \frac{245.25}{\sin 55^\circ} &= \frac{F_{T1} \sin 55^\circ}{\sin 55^\circ} \\ F_{T1} &= \boxed{299\text{N}} \text{ [25]} \\ 0 &= F_{T2} - 299 \cos 55^\circ \\ F_{T2} &= \boxed{172\text{N}} \text{ [0]} \end{aligned}$$

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Ex 3.6)



one system

$$M_T = m_A + m_B + m_C$$

$$M_T = 165 \text{ kg}$$

horizontal: $\vec{F}_{\text{net}} = \vec{F}_A + \vec{F}_B + \vec{F}_p$

$$= 400 \text{ N} + 420 \text{ N} + 380 \text{ N}$$

$$= 440 \text{ N}$$

$$\vec{F}_{\text{net}} = m_T \vec{a}$$

$$440 = 165 \vec{a}$$

$$\vec{a} = 2.7 \text{ m/s}^2 \text{ [forward]}$$