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RESISTENCIA DE MATERIALES DE CONSTRUCCION

SISTEMAS DE FUERZAS CONCURRENTES

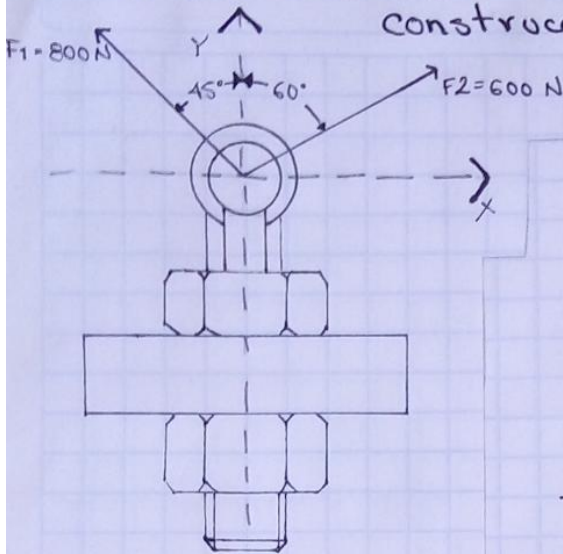
PASIÓN POR EDUCAR

4TO. CUATRIMESTRE

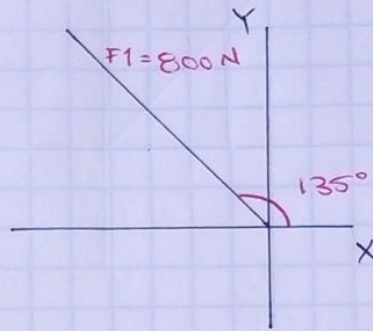
LAR- LICENCIATURA EN ARQUITECTURA "A"

COMITAN DE DOMINGUEZ CHIAPAS A 23 SEPTIEMBRE 2021

Resistencia de materiales de construcción



hallar F_R y Dirección

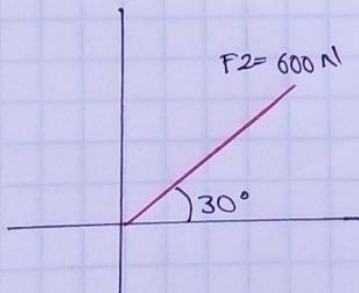


$$\cos \phi = \frac{CA}{H} \rightarrow \cos 135^\circ = \frac{F_{1X}}{800\text{ N}}$$

$$F_{1X} = 800\text{ N} \cdot \cos 135^\circ = -565.685$$

$$\text{Sen } \phi = \frac{CO}{H} \rightarrow \text{Sen } 135^\circ = \frac{F_{1Y}}{800\text{ N}}$$

$$F_{1Y} = 800\text{ N} \cdot \text{Sen } 135^\circ = 565.685$$



$$\cos \phi = \frac{CA}{H} \rightarrow \cos 30^\circ = \frac{F_{2X}}{600\text{ N}}$$

$$F_{2X} = 600\text{ N} \cdot \cos 30^\circ = 519.615$$

$$\text{Sen } \phi = \frac{CO}{H} \rightarrow \text{Sen } 30^\circ = \frac{F_{2Y}}{600\text{ N}}$$

$$F_{2Y} = 600\text{ N} \cdot \text{Sen } 30^\circ = 300$$

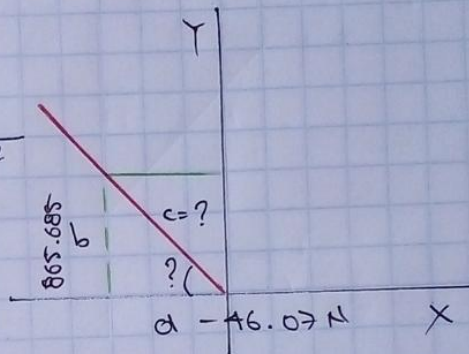
$$\sum F_x = -565.685 \text{ N} + 519.615 \text{ N} = -46.07 \text{ N}$$

$$\sum F_y = 300 \text{ N} + 565.685 \text{ N} = 865.685 \text{ N}$$

$$c = \sqrt{a^2 + b^2}$$

$$c = \sqrt{(-46.07 \text{ N})^2 + (865.685 \text{ N})^2}$$

$$FR = 866.910 \text{ N}$$



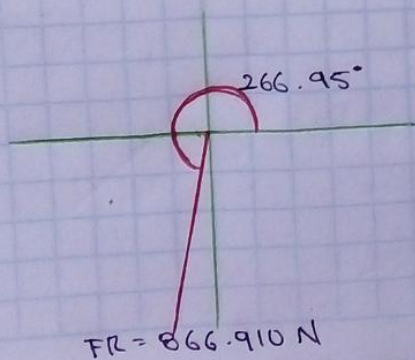
$$\tan \alpha = \frac{CO}{CA} = \alpha = \tan^{-1} \frac{CO}{CA}$$

$$\alpha = \tan^{-1} \frac{865.685 \text{ N}}{-46.07 \text{ N}}$$

$$\alpha = -86.95$$

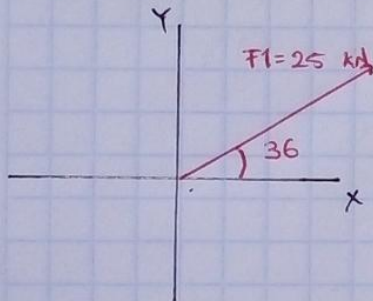
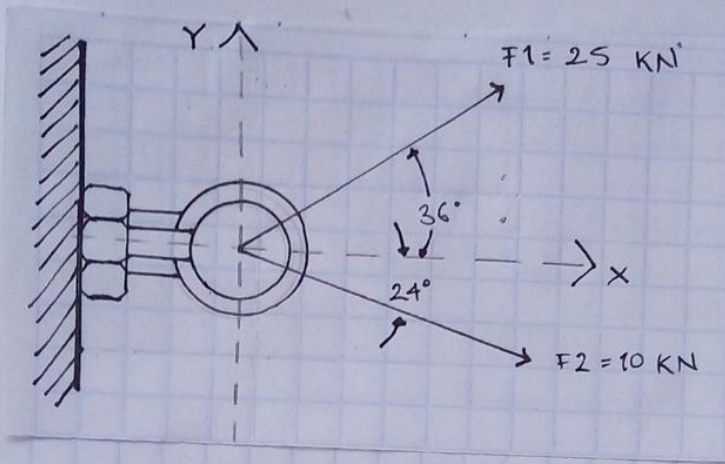
$$\phi = 180^\circ - (-86.95^\circ)$$

$$\phi = 266.95^\circ$$



Hallar F_R y Dirección

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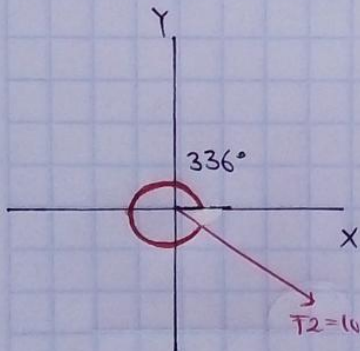


$$\cos \phi = \frac{CA}{H} \rightarrow \cos 36^\circ = \frac{F_{1X}}{25 \text{ N}}$$

$$F_{1X} = 25 \text{ N} \cdot \cos 36^\circ = 20.225 \text{ kN}$$

$$\text{Sen } \phi = \frac{CO}{H} \rightarrow \text{Sen } 36^\circ = \frac{F_{1Y}}{25 \text{ N}}$$

$$F_{1Y} = 25 \text{ N} \cdot \text{Sen } 36^\circ = 14.695 \text{ kN}$$



$$\cos \phi = \frac{CA}{H} \rightarrow \cos 336^\circ = \frac{F_{2X}}{10 \text{ kN}}$$

$$F_{2X} = 10 \text{ kN} \cdot \cos 336^\circ = 9.135 \text{ kN}$$

$$\text{Sen } \phi = \frac{CO}{H} \rightarrow \text{Sen } 336^\circ = \frac{F_{2Y}}{10 \text{ kN}}$$

$$F_{2Y} = 10 \text{ kN} \cdot \text{Sen } 336^\circ = -4.067 \text{ kN}$$

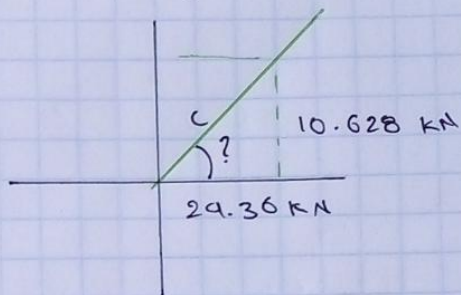
$$F_{RX} = \sum F_x = 20.225_{\text{KN}} + 9.135_{\text{KN}} = 29.36 \text{ KN}$$

$$\sum F_y = 14.695_{\text{KN}} + (-4.067_{\text{KN}}) = 10.628 \text{ KN}$$

$$C = \sqrt{a^2 + b^2}$$

$$C = \sqrt{(29.36)^2 + (10.628)^2}$$

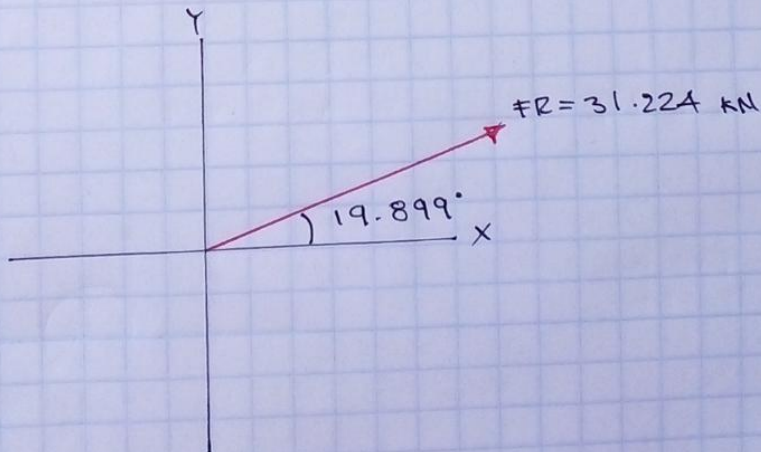
$$FR = 31.224$$



$$\tan \alpha = \frac{CO}{CA} \rightarrow \alpha = \tan^{-1} \frac{CO}{CA}$$

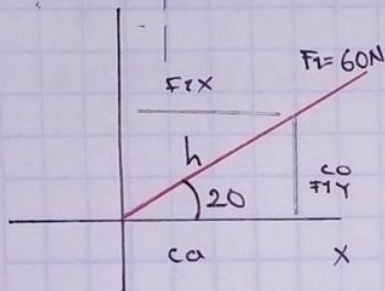
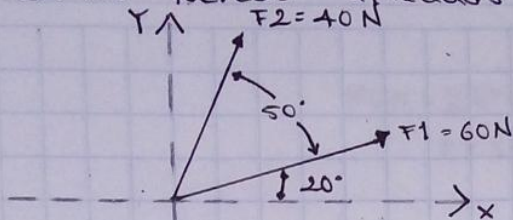
$$\alpha = \tan^{-1} \frac{10.628 \text{ KN}}{29.36 \text{ KN}}$$

$$\alpha = 19.899$$



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Hallar la magnitud y dirección de las resultantes, en las fuerzas aplicadas a los tornillos

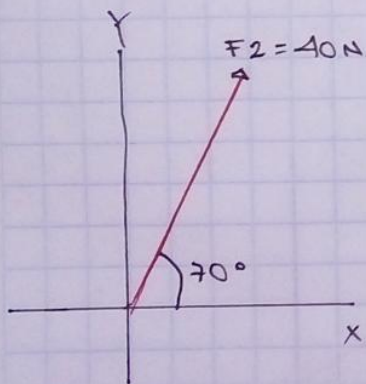


$$\cos \phi = \frac{CA}{H} \rightarrow \cos 20^\circ = \frac{F_{1X}}{60\text{N}}$$

$$F_{1X} = 60\text{N} \cdot \cos 20^\circ = 56.382$$

$$\sin \phi = \frac{CO}{H} \rightarrow \sin 20^\circ = \frac{F_{1Y}}{60\text{N}}$$

$$F_{1Y} = 60\text{N} \cdot \sin 20^\circ = 20.521$$



$$\cos \phi = \frac{CA}{H} \rightarrow \cos 70^\circ = \frac{F_{2X}}{40\text{N}}$$

$$F_{2X} = 40\text{N} \cdot \cos 70^\circ = 13.681$$

$$\sin \phi = \frac{CO}{H} \rightarrow \sin 70^\circ = \frac{F_{2Y}}{40\text{N}}$$

$$F_{2Y} = 40\text{N} \cdot \sin 70^\circ = 37.588$$

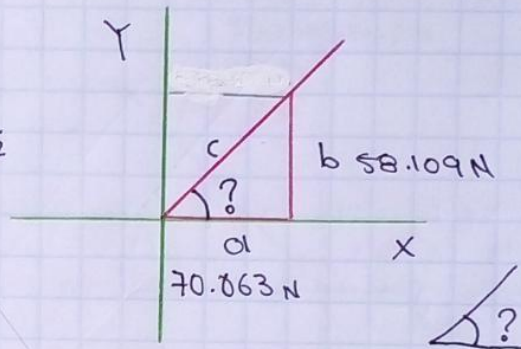
$$F_{RX} = \sum F_x = 56.382 + 13.681 = 70.063 \text{ N}$$

$$\sum F_y = 20.521 + 37.588 = 58.109 \text{ N}$$

$$c = \sqrt{a^2 + b^2}$$

$$c = \sqrt{(70.063 \text{ N})^2 + (58.109 \text{ N})^2}$$

$$F_R = 91.025 \text{ N}$$



$$\tan \alpha = \frac{CO}{CA} = \alpha = \tan^{-1} \frac{CO}{CA}$$

$$\alpha = \tan^{-1} \frac{58.109 \text{ N}}{70.063 \text{ N}}$$

$$\alpha = 39.672$$

