



Mi Universidad

Ejercicios

Alejandra Monserrath Aguilar Gómez

Fuerzas Coplanares

Primer Parcial

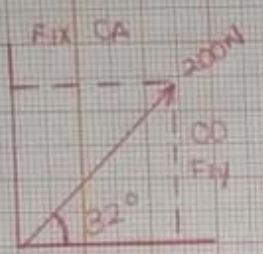
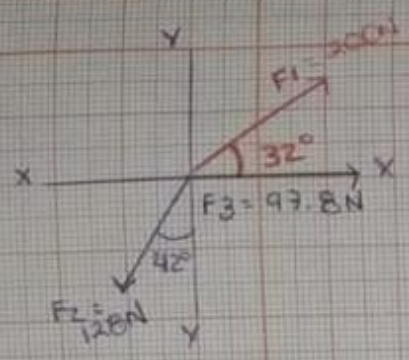
Resistencia de materiales de construcción

Pedro Alberto García López

Arquitectura

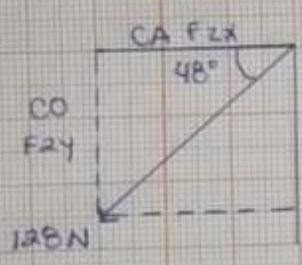
Cuarto Cuatrimestre

Comitán de Domínguez, 20/Septiembre/2023



$$\sin 32^\circ = \frac{F_{1y}}{200N} \Rightarrow F_{1y} = \sin 32^\circ (200N) = 105.983N$$

$$\cos 32^\circ = \frac{F_{1x}}{200N} \Rightarrow F_{1x} = \cos 32^\circ (200N) = 169.609N$$



$$\sin 48^\circ = \frac{F_{2y}}{120N} \Rightarrow F_{2y} = \sin 48^\circ (120N) = -95.182N$$

$$\cos 48^\circ = \frac{F_{2x}}{120N} \Rightarrow F_{2x} = \cos 48^\circ (120N) = -85.648N$$

$$F_3 = F_{3x} = 97.8N$$

$$EF_x = 169.609N - 85.648N + 97.8N = 181.761$$

$$EF_y = 105.983N - 95.182N = 10.801$$

$$H = \sqrt{(181.761)^2 + (10.801)^2}$$

$$H = \sqrt{33037.081 + 117.961}$$

$$H = \sqrt{33155.042}$$

$$H = 182.085N$$

$$\tan \phi = CO/CA$$

$$\phi = 0.059$$

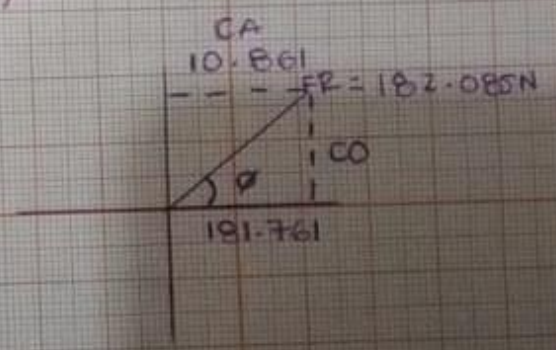
$$\phi = \tan^{-1} CO/CA$$

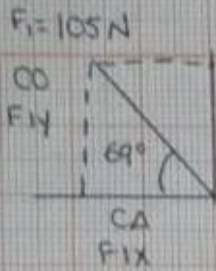
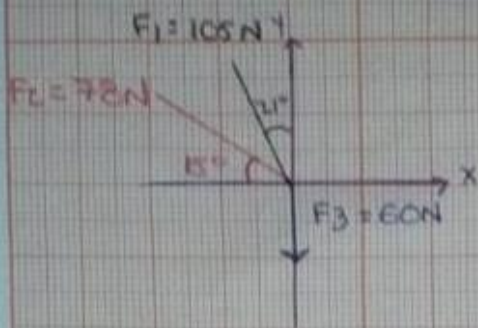
$$\tan^{-1}(0.059) = 3.376$$

$$\tan^{-1} \frac{10.801}{181.761}$$

$$90 - 3.376 = 86.624$$

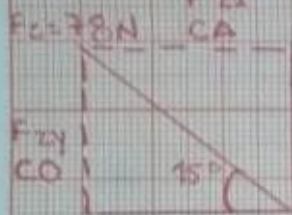
$$360 - 3.376 = 356.624$$





$$\text{Sen } 69^\circ = F_{1Y} = \text{Sen } 69^\circ (105\text{N}) = \underline{98.025\text{N}}$$

$$\text{Cos } 69^\circ = F_{1X} = \text{Cos } 69^\circ (105\text{N}) = \underline{-37.628\text{N}}$$



$$\text{Sen } 15^\circ = F_{2Y} = \text{Sen } 15^\circ (78\text{N}) = \underline{20.187\text{N}}$$

$$\text{Cos } 15^\circ = F_{2X} = \text{Cos } 15^\circ (78\text{N}) = \underline{-75.342\text{N}}$$

$$F_3 = F_{3Y} = \underline{-60\text{N}}$$

$$\Sigma F_x = 37.628\text{N} + 75.342\text{N} = \underline{-112.97\text{N}}$$

$$\Sigma F_y = 98.025\text{N} + 20.187\text{N} - 60\text{N} = \underline{58.212}$$

$$H = \sqrt{(-112.97\text{N})^2 + (58.212)^2}$$

$$H = \sqrt{12762.2209 + 3388.6369}$$

$$H = \sqrt{16150.8578}$$

$$H = \underline{127.086\text{N}}$$

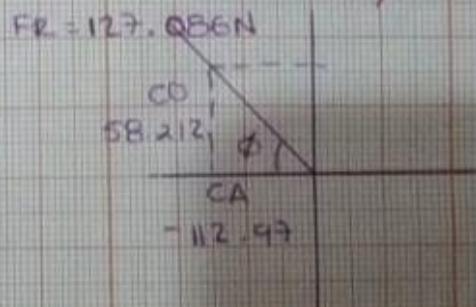
$$\tan \phi = \text{CO/CA}$$

$$\phi = \tan^{-1} \text{CO/CA}$$

$$\tan^{-1} \frac{58.212}{-112.97}$$

$$\phi = \underline{-0.515}$$

$$\tan^{-1}(-0.515) = \underline{-27.248}$$



$$90 - 27.248 = \underline{62.752}$$

$$180 - 27.248 = \underline{152.752}$$