



**Nombre de alumno:** Elías Javier  
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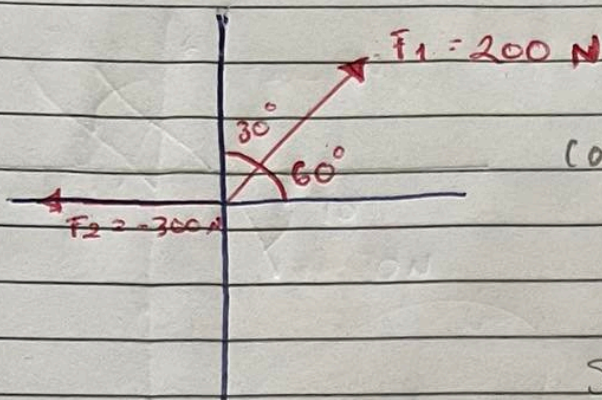
**Nombre del profesor:** Arq. Pedro  
Alberto García López

**Nombre del trabajo:** Ejercicios  
Resultante de Fuerzas Concurrentes

**Materia:** Resistencia de materiales

**Grado:** 4to Cuatrimestre.

**Carrera:** Arquitectura.



$$\cos 60^\circ = \frac{F_{1x}}{200 \text{ N}} = F_{1x} = 200 (\cos 60^\circ)$$

$$= F_{1x} = 100 \text{ N}$$

$$\sin 60^\circ = \frac{F_{1y}}{200 \text{ N}} = F_{1y} = 200 (\sin 60^\circ)$$

$$\Sigma F_x = 100 \text{ N} - 300 \text{ N} = -200 \text{ N}$$

$$F_{1y} = 173.205$$

$$R = \sqrt{-200 + 173.205}$$

$$\Sigma F_y = 173.205 \text{ N}$$

$$-10000 + 29999.972$$

$$\theta = \tan^{-1} \frac{173.205}{-200} = \frac{c}{a}$$

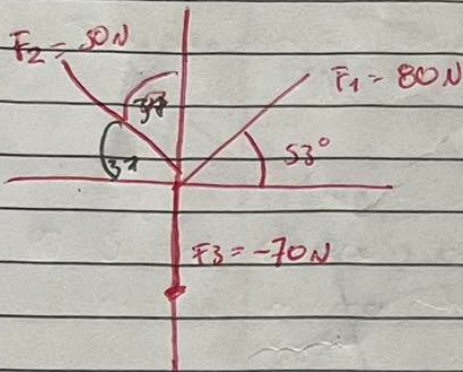
$$R = \sqrt{69999.972}$$

$$R = 264.575$$

$$\theta = \tan^{-1} \frac{173.205}{-200} = -49.27^\circ$$

$$\theta = -49.27^\circ$$

$$-70^\circ 53' 36.17''$$



$$\times \sin \theta = \frac{cd}{H}$$

$$\times \cos \theta = \frac{cd}{H}$$

$$\cos 53^\circ = \frac{F_{1x}}{80N} \quad F_{1x} = 80 (\cos 53^\circ)$$

$$\sin 53^\circ = \frac{F_{1y}}{80N} \quad F_{1y} = 80 (\sin 53^\circ)$$

$$\cos 37^\circ \frac{F_{2y}}{50N} \rightarrow F_{2x} = 50N (\cos 37^\circ)$$

$$= 39.93$$

$$F_{1x} = 48.14 \text{ N}$$

$$F_{1y} = 63.89 \text{ N}$$

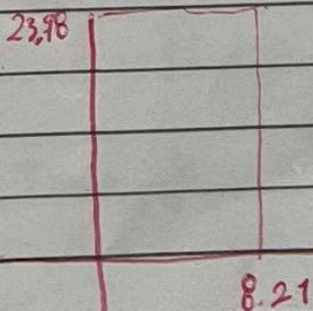
$$\sin 37^\circ \frac{F_{2y}}{50N} = F_{2y} = 50N (\sin 37^\circ)$$

$$F_3 = -70N = F_{3y}$$

$$= 30.09$$

$$\Sigma F_x = 48.14 + 39.93 \text{ N} = ~~88.07~~ \text{ N} \quad 8.21 \text{ N}$$

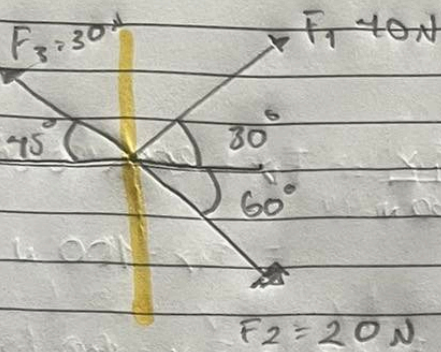
$$\Sigma F_y = 63.89 \text{ N} + 30.09 \text{ N} + (-70 \text{ N}) = 23.98 \text{ N}$$



$$R = 25.192$$

$$\theta \tan^{-1} = \frac{23.98}{8.21}$$

$$\theta = 71.098$$



$$\cos 30^\circ = \frac{F_{1x}}{40} \quad F_{1x} = 40 (\cos 30^\circ) = 34.64 \text{ N}$$

$$\sin 30^\circ = \frac{F_{1y}}{40} \quad F_{1y} = 40 (\sin 30^\circ) = 20 \text{ N}$$

$$\cos 60^\circ = \frac{F_{2x}}{20} \quad F_{2x} = 20 (\cos 60^\circ) = 10 \text{ N}$$

$$\sin 60^\circ = \frac{F_{2y}}{20} \quad F_{2y} = 20 (\sin 60^\circ) = 17.32 \text{ N}$$

$$\cos 45^\circ = \frac{F_{3x}}{30} \quad F_{3x} = 30 (\cos 45^\circ) = 21.21 \text{ N}$$

$$\sin 45^\circ = \frac{F_{3y}}{30} \quad F_{3y} = 30 (\sin 45^\circ) = 21.21 \text{ N}$$

$$\Sigma F_x = 23.43$$

$$\Sigma F_y = 23.89$$

$$R = \sqrt{23.43^2 + 23.89^2}$$

$$R = \sqrt{548.964 + 570.732}$$

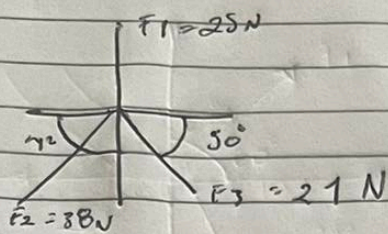
$$R = \sqrt{1119.696}$$

$$R = 33.461 \text{ N}$$

$$\theta = \tan^{-1} \frac{23.89}{23.43}$$

$$23.43$$

$$\theta = 45.586^\circ$$



$$\cos 42^\circ = \frac{F_{2x}}{38} = F_{2x} = 38(\cos 42^\circ)$$

$$= -28.234$$

$$\sin 42^\circ = \frac{F_{2y}}{38} = F_{2y} = 38(\sin 42^\circ)$$

$$= -25.422$$

$$\cos 50^\circ = F_{3x} = F_3 \cos 50^\circ$$

$$= 13.482$$

$$\sin 50^\circ = F_{3y} = F_3 \sin 50^\circ = -21(\sin 50^\circ) = -16.086$$

$$\Sigma F_x = -28.234 + 13.482 = -14.752$$

$$\Sigma F_y = 25 - 25.422 - 16.086 = -16.508$$

$$R = \sqrt{14.752^2 + 16.508^2}$$

$$R = \sqrt{217.621 + 272.514}$$

$$R = \sqrt{490.135}$$

$$R = 22.138 \text{ N}$$

$$\theta = \tan^{-1} \frac{16.508}{-14.752}$$

$$\theta = 48.215$$