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Nombre del trabajo: ejercicio

Materia: Resistencia de materiales de
construcción.

Grado: 4-º Cuatrimestre

Comitán de Domínguez Chiapas a 25 de septiembre del 2022.

$F_1 = 25 \text{ N}$
 $\cos 42^\circ = \frac{F_{2x}}{-38}$ $F_{2x} = -38 (\cos 42^\circ) = -28.231 \text{ N}$
 $\sin 42^\circ = \frac{F_{2y}}{-38}$ $F_{2y} = -38 (\sin 42^\circ) = -25.442 \text{ N}$
 $F_3 = 21 \text{ N}$
 $F_2 = -38 \text{ N}$

$$\cos 30^\circ = \frac{F_{3x}}{21} \quad F_{3x} = 21 (\cos 30^\circ) = 18.187 \text{ N}$$

$$\sin 30^\circ = \frac{F_{3y}}{-21} \quad F_{3y} = -21 (\sin 30^\circ) = -10.5 \text{ N}$$

$$\Sigma F_x = -28.231 + 18.187 = -10.044 \text{ N}$$

$$\Sigma F_y = 25 - 25.442 - 10.5 = -10.942 \text{ N}$$

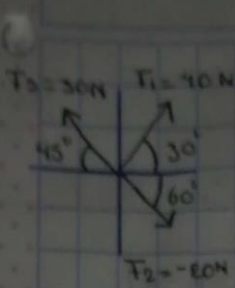
$$R = \sqrt{(-10.044)^2 + (-10.942)^2}$$

$$R = \sqrt{100.88 + 119.73}$$

$$R = \sqrt{220.61}$$

$$R = 14.85 \text{ N}$$

$$\theta = \tan^{-1} \left(\frac{-10.942}{-10.044} \right) = 47.5^\circ$$



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

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

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

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

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

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

$$\Sigma F_x = 34.64N + 10N - 21.21N = 23.43N$$

$$\Sigma F_y = 20 - 17.32 + 21.21 = 23.89N$$

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

$$R = \sqrt{548.96 + 570.732}$$

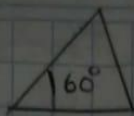
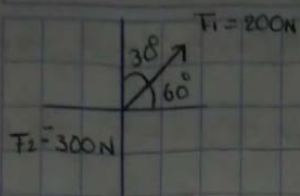
$$R = \sqrt{1119.696}$$

$$R = 33.46N$$

$$\tan \theta = \frac{23.89}{23.43}$$

$$\theta = 45.556^\circ$$

23.45



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

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

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

$$F_{1Y} = 173.20\text{ N}$$

$$\Sigma F_X = 100 = -200\text{ N}$$

$$\Sigma F_Y = 173.20\text{ N}$$

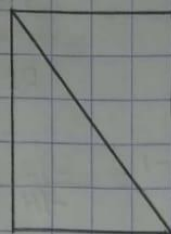
$$R = \sqrt{(-200)^2 + (173.20)^2}$$

$$R = \sqrt{49000^2 + 29,998.24^2}$$

$$R = 264.57$$

$$R = \sqrt{69,998.24}$$

$$R = 264.57$$

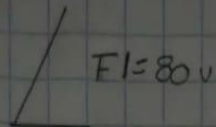
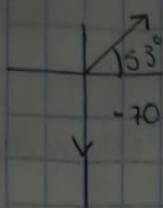


$$\theta = \tan^{-1} \frac{173.20}{-200}$$

$$\theta = -40.89314$$

$$-40^\circ 53' 36.77''$$

$$\tan^{-1} = \frac{ca}{x}$$



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

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

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

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

$$\sin 53^\circ \frac{F_{2x}}{50N} \Rightarrow F_{2x} = 50N (\sin 53^\circ) = -39.93N$$

$$\cos 53^\circ \frac{F_{2y}}{50N} \Rightarrow F_{2y} = 50N (\cos 53^\circ) = 30.09N$$

$$\Sigma F_x = 48.14N - 39.93 = 8.21$$

$$\Sigma F_y = 63.89N + 30.09 + (-70) = 23.89$$

$$R = \sqrt{8.21^2 + 23.89^2}$$

23.89

$$R = \sqrt{67.40^2 + 570.73^2}$$

$$R = \sqrt{638.132}$$

$$R = 25.26N$$

$$\theta = \tan^{-1} \frac{23.89}{8.21} = 71.03^\circ$$