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Nombre del trabajo: Ejercicios

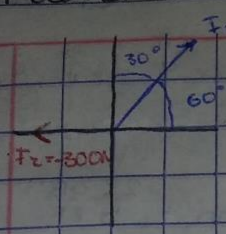
Materia: Resistencia de materiales de construcción

Grado: 4

Grupo: Arquitectura

Resultantes de fuerzas concurrentes

21-Sep-22



1

$\cos 60 = \frac{Fx}{200}$ $Fx = 200(\cos 60)$ 0.5

$Fx = 100N$

$\operatorname{sen} 60 = \frac{Fy}{200}$ $Fy = 200(\operatorname{sen} 60)$ 0.866

$Fy = 173.205N$

$x \quad 100 - 300 = -200N$

$y = 173.205N$

$\tan = \frac{co}{ca}$

$R = \sqrt{(-200)^2 + (173.205N)^2}$

$= \sqrt{40000^2 + 29.999.972^2}$

$\sqrt{69.999.972^2}$

$R = 264.575N$

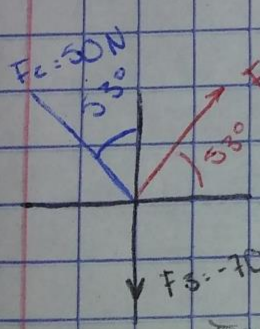
$\tan^{-1} = \frac{173.205}{-200}$

$\tan^{-1} = -40.893$

$\theta -40.893$

$-40° 53' 36.71''$

2



$\cos 53 = \frac{Fx}{80}$ $Fx = 80(\cos 53)$

$Fx = 48.14N$

$\operatorname{sen} 53 = \frac{Fy}{80}$ $Fy = 80(\operatorname{sen} 53)$

$Fy = 63.89N$

$\cos 37 = \frac{Fx}{50}$ $Fx = 50(\cos 37)$

$Fx = -39.97N$

$\operatorname{sen} 37 \frac{Fy}{80}$ $Fy = 50 \operatorname{sen}(37)$

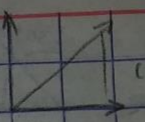
$Fy = 30.09N.$

Resultantes de fuerzas concurrentes

21-Sep-22

x 48.14 - 39.93 = 8.21 N

y 63.39 + 30.09 - 70 = -23.98 N



$R = \sqrt{(8.21)^2 + (-23.98)^2}$

$\sqrt{67.40^2 + 575.04^2}$

$\sqrt{642.44^2}$

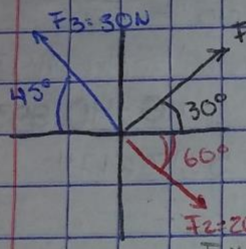
$R = 25.34\ N \rightarrow$

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

$\theta = 71.1004$

$71° 06' 1.46''$

③



$\cos 30 = \frac{Fx}{40} = Fx\,40(\cos 30)$ (0.866)

$Fx = 34.64\ N$

$\text{sen}\,30 = \frac{Fy}{30} = Fy\,40(\text{sen}\,30)$ (0.5)

$Fy = 20\ N$

$\cos 60 = \frac{Fx}{20} = Fx\,20(\cos 60)$ (0.5)

$Fx = 10\ N$

$\text{sen}\,60 = \frac{Fy}{20} = Fy\,-20(-\text{sen}\,60)$ (0.866)

$Fy = -17.32\ N$

$\cos 45\ \frac{Fx}{30} = Fx\,30(\cos 45)$ (0.707)

$Fx = -21.21\ N$

$\text{sen}\,45\ \frac{Fy}{30} = Fy\,30(\text{sen}\,45)$ (0.707)

$Fy = 21.21\ N$

Resultantes de fuerzas concurrentes

21-Sep-22

x 34.64 + 10 - 21.21 = 23.43 N

y 20 - 17.32 + 21.21 = 23.89 N

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

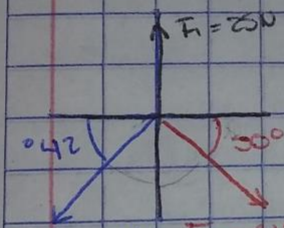
$\sqrt{548.964^2 + 570.732^2}$

$\sqrt{1119.696^2}$

$R = 33.461\ N \rightarrow$

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

$\theta\ 45.556$



(4)

$\cos 42 = \frac{Fx}{38}$ $F_x = 38(\cos 42)$ 0.743

$F_x = 28.234$

$\sin 42 = \frac{Fy}{38}$ $F_y = 38(\sin 42)$ 0.669

$F_y = -25.422$

$\cos 30 = \frac{Fx}{21}$ $F_x = 21(\cos 30)$ 0.866

$F_x = 13.482$

$\sin 30 = \frac{Fy}{21}$ $F_y = 21(\sin 30)$ 0.766

$F_y = -16.086$

x = -28.234 + 13.482 = -14.752

y 25 - 25.422 - 16.086 = -16.508

Resultantes de fuerzas concurrentes

21-SEP-22

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

$\sqrt{(217.621)^2 + 272.514}$

$\sqrt{490.135^2}$

$R = 22.138N$

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

$\theta 48.215$