Universidad Del Sureste

Nombre Del Alumno: Antonio De Jesús Lopez Lopez

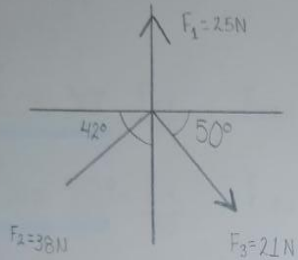Nombre Del Profesor: Pedro Alberto García Lopez

Nombre De La Asignatura: Resistencia De Materiales De Construcción

Nombre De La Actividad: Resultante De Fuerzas Concurrentes

Grado: 4to Cuatrimestre

Carrera: Arquitectura

Ejercicios

$$\cos 42° = \frac{F_{2x}}{38} \qquad F_{2x} = 38 (\cos 42°) = 28.234 \, N$$

$$\text{Sen } 42° = \frac{F_{2y}}{-38} \qquad F_{2y} = -38 (\text{sen } 42°) = -25.422 \, N$$

$$\cos 50° = \frac{F_{3x}}{21} \qquad F_{3x} = 21 (\cos 50°) = 13.482 \, N$$

$$\text{Sen } 50° = \frac{F_{3y}}{-21} \qquad F_{3y} = -21 (\text{sen } 50°) = -16.086 \, N$$

$$\Sigma Fx = -28.234 + 13.482 = -14.752 \, N$$

$$\Sigma Fy = 25 - 25.422 - 16.086 = -16.508 \, N$$

$$R = \sqrt{-14.752^2 + 16.508^2}$$
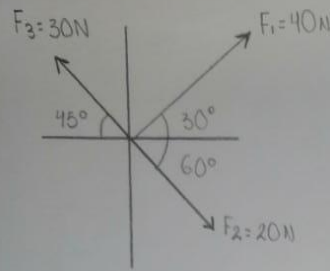$$R = \sqrt{217.621 + 272.514}$$
$$R = \sqrt{490.135}$$
$$R = 22.138 \, N$$

$$\theta \tan^{-1} = \frac{-16.508}{-14.752}$$
$$\theta = 48.215$$

$$\cos 30° = \frac{F_{1x}}{40} \qquad F_{1x} = 40 (\cos 30°) = 34.64 \, N$$

$$\text{Sen } 30° = \frac{F_{1y}}{40} \qquad F_{1y} = 40 (\text{sen } 30°) = 20 \, N$$

$$\cos 60° = \frac{F_{2x}}{20} \qquad F_{2x} = 20 (\cos 60°) = 10 \, N$$

$$\text{Sen } 60° = \frac{F_{2y}}{-20} \qquad F_{2y} = -20 (\text{sen } 60°) = -17.32 \, N$$

$$\cos 45° = \frac{F_{3x}}{-30} \qquad F_{3x} = -30 (\cos 45°) = -21.21 \, N$$

$$\text{Sen } 45° = \frac{F_{3y}}{30} \qquad F_{3y} = 30 (\text{sen } 45°) = 21.21 \, N$$

$$\Sigma Fx = 34.64 + 10 - 21.21 = 23.43$$
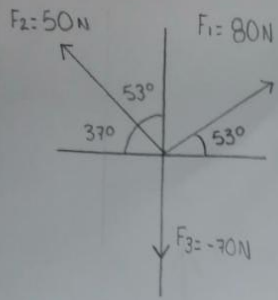$$\Sigma Fy = 20 - 17.32 + 21.21 = 23.89$$

$$R = \sqrt{23.43^2 + 23.89^2}$$
$$R = 548.964 + 570.732$$
$$R = \sqrt{1119.696}$$
$$R = 33.461 \, N$$

$$\theta \tan^{-1} = \frac{23.89}{23.43}$$
$$\theta = 45.556 \, N$$

Left problem:

$F_2 = 50N$ | $F_1 = 80N$

53°

37° 53°

$F_3 = -70N$

$\cos 53° = \dfrac{F_{1x}}{80}$ $F_{1x} = 80(\cos 53°) = 48.08\ N$

$\text{Sen } 53° = \dfrac{F_{1y}}{80}$ $F_{1y} = 80(\text{sen } 53°) = 63.84\ N$

$\cos 37° = \dfrac{F_{2x}}{-50}$ $F_{2x} = -50(\cos 37°) = -39.9\ N$

$\text{Sen } 37° = \dfrac{F_{2y}}{50}$ $F_{2y} = 50(\text{sen } 37°) = 30.05\ N$

$\sum F_x = 8.18\ N$

$\sum F_y = 23.89\ N$

$R = \sqrt{8.18^2 + 23.89^2}$ $\theta \tan^{-1} = \dfrac{23.89}{8.18}$

$R = \sqrt{63.912 + 570.732}$

$R = \sqrt{634.644}$ $\theta = 71.098$

$R = 25.192\ N$

Right problem:

$F_1 = 200N$

30°

60°

$F_2 = 300\ N$
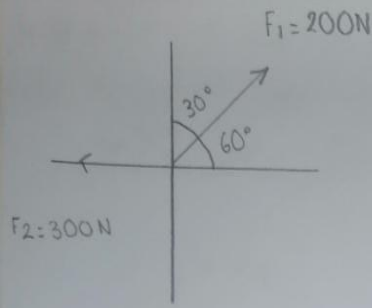
$\cos 60° = \dfrac{F_{1x}}{200}$ $F_{1x} = 200(\cos 60°) = 100\ N$

$\text{Sen } 60° = \dfrac{F_{1y}}{200}$ $F_{1y} = 200(\text{sen } 60°) = 173.205\ N$

$\sum F_x = 100 - 300 = -200\ N$

$\sum F_y = 173.205\ N$

$R = \sqrt{-200^2 + 173.205^2}$ $\theta \tan^{-1} = \dfrac{173.205}{-200}$

$R = \sqrt{40000 + 29999.972}$

$R = \sqrt{69999.972}$ $\theta = -40.893$

$R = 264.575\ N$

$-40°\ 53'\ 36.17''$