



Mi Universidad

ACTIVIDAD

Nombre del Alumno: Uriel Fernando Ruiz Espinosa

Nombre del tema: Resultante de Fuerzas Concurrentes

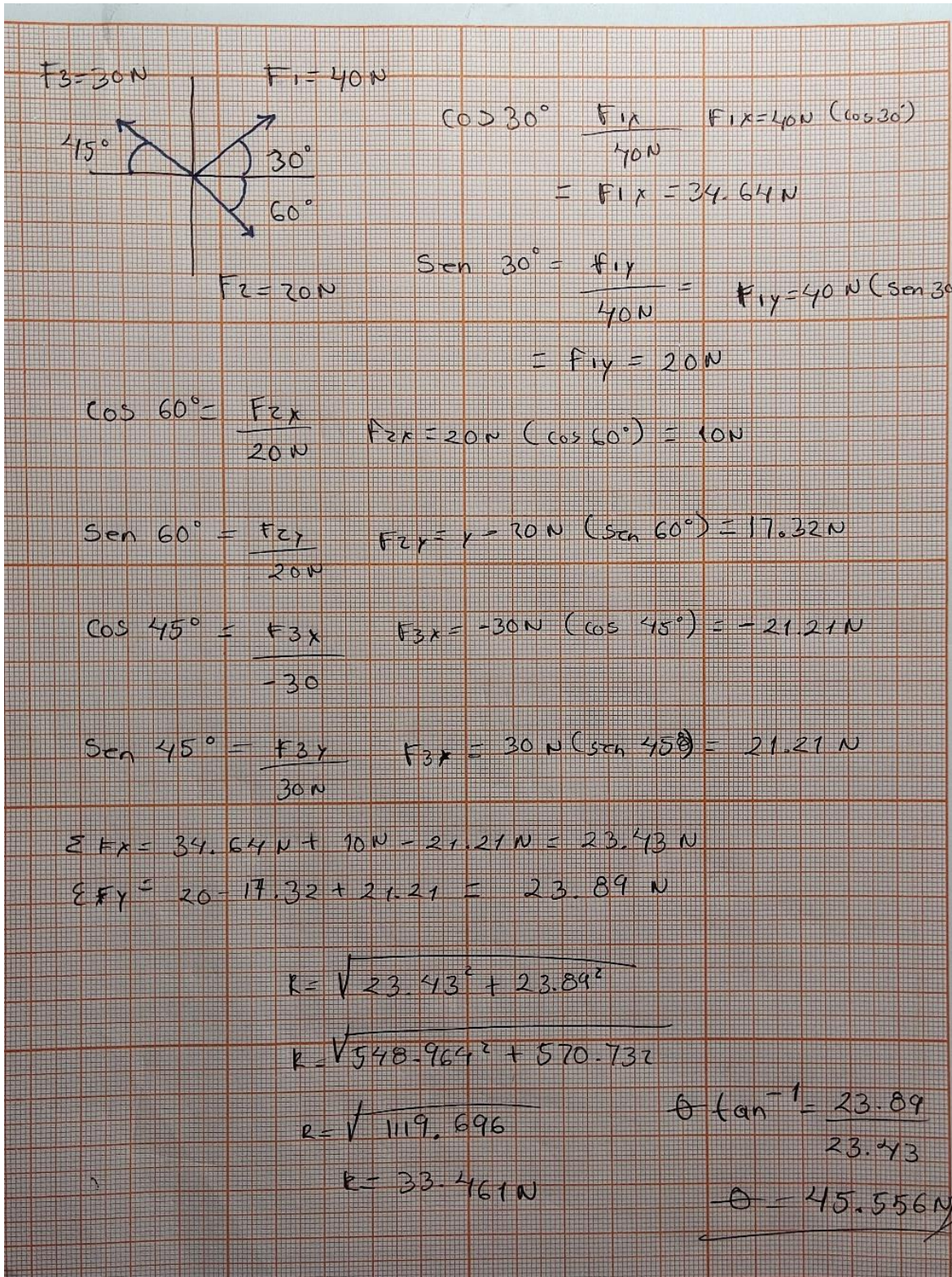
Parcial: I

Nombre de la Materia: Resistencia de Materiales de Construcción

Nombre del profesor: Pedro Alberto García

Nombre de la Licenciatura: Arquitectura

Cuatrimestre: 4to



$F_3 = 30\text{ N}$ $F_1 = 40\text{ N}$

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

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

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

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

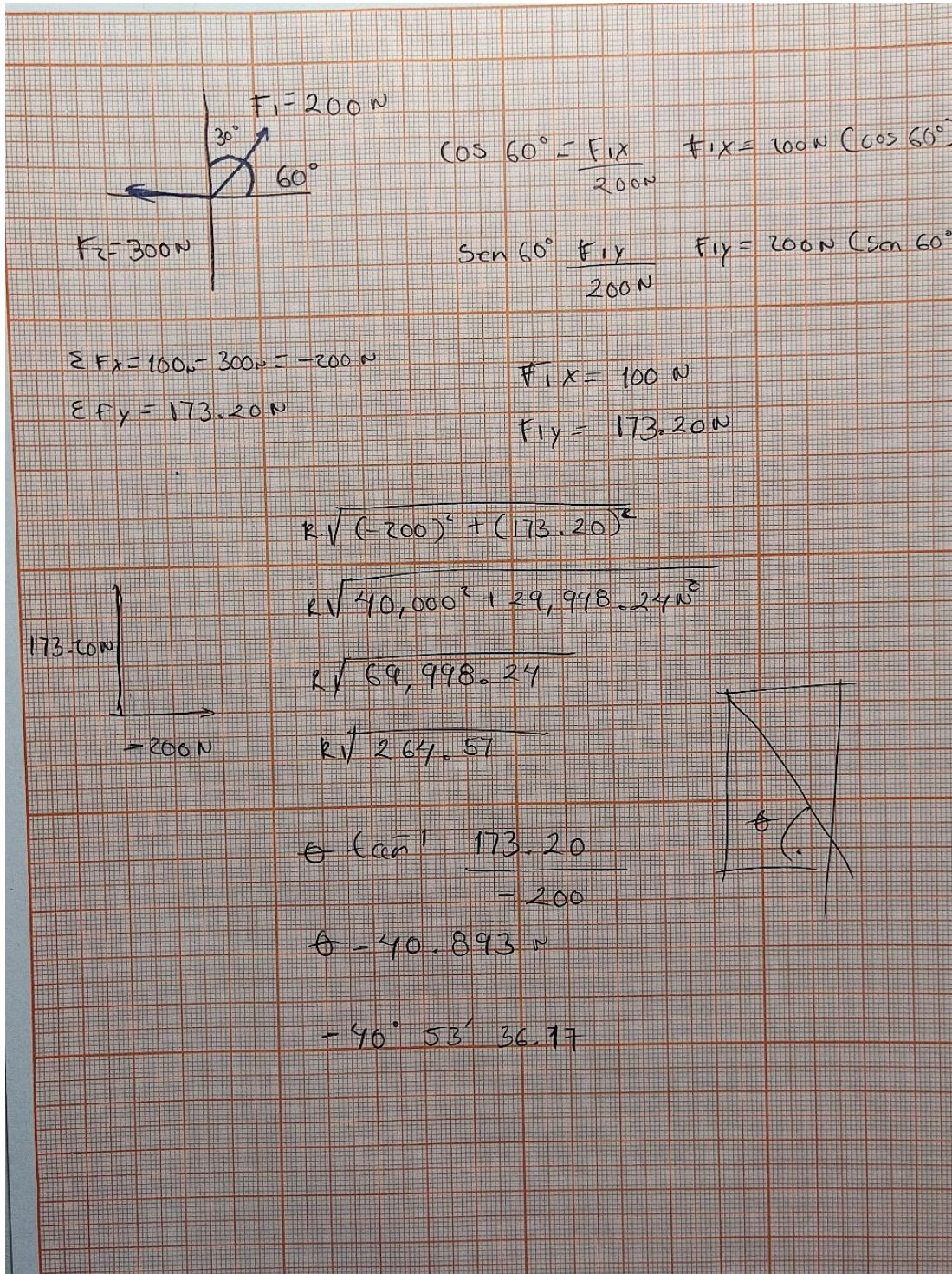
$\cos 45^\circ = \frac{F_{3x}}{-30}$ $F_{3x} = -30\text{ N} (\cos 45^\circ) = -21.21\text{ N}$

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

$\Sigma F_x = 34.64\text{ N} + 10\text{ N} - 21.21\text{ N} = 23.43\text{ N}$
 $\Sigma F_y = 20 - 17.32 + 21.21 = 23.89\text{ N}$

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

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



$F_1 = 200\text{ N}$
 $F_2 = 300\text{ N}$

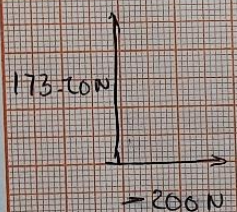
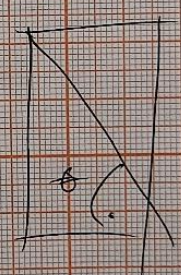
$\cos 60^\circ = \frac{F_{1x}}{200\text{ N}} \quad F_{1x} = 200\text{ N} (\cos 60^\circ)$
 $\sin 60^\circ = \frac{F_{1y}}{200\text{ N}} \quad F_{1y} = 200\text{ N} (\sin 60^\circ)$

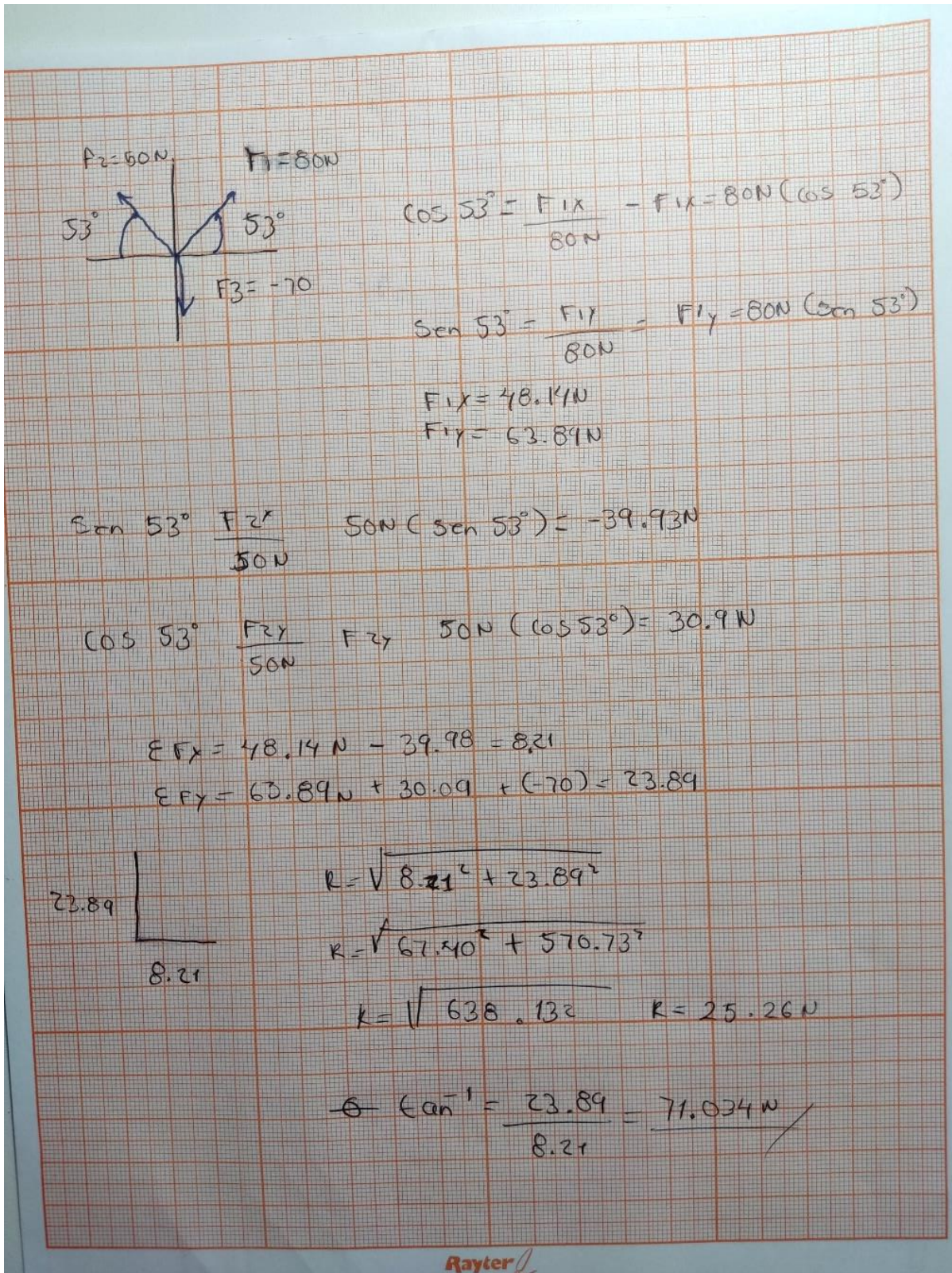
$\Sigma F_x = 100 - 300 = -200\text{ N}$
 $\Sigma F_y = 173.20\text{ N}$

$F_{1x} = 100\text{ N}$
 $F_{1y} = 173.20\text{ N}$

$R = \sqrt{(-200)^2 + (173.20)^2}$
 $R = \sqrt{40,000^2 + 29,998.24\text{ N}^2}$
 $R = \sqrt{69,998.24}$
 $R = \sqrt{264.57}$

$\theta = \tan^{-1} \frac{173.20}{-200}$
 $\theta = -40.893^\circ$
 $= -40^\circ 53' 36.17$



$F_2 = 80\text{N}$ $F_1 = 80\text{N}$
 53° 53°
 $F_3 = -70$

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

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

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

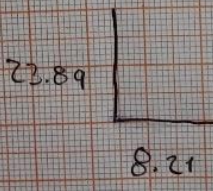
$$F_{1y} = 63.89\text{N}$$

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

$$\cos 53^\circ \frac{F_{2y}}{50\text{N}} \quad F_{2y} \quad 50\text{N} (\cos 53^\circ) = 30.9\text{N}$$

$$\Sigma F_x = 48.14\text{N} - 39.98 = 8.21$$

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

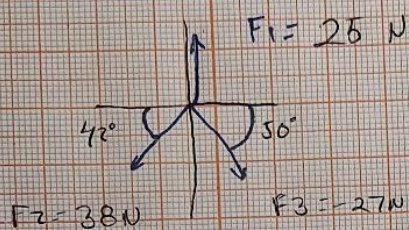


$$R = \sqrt{8.21^2 + 23.89^2}$$

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

$$R = \sqrt{638.13} \quad R = 25.26\text{N}$$

$$\theta = \tan^{-1} = \frac{23.89}{8.21} = 71.034^\circ$$



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

$$F_{2x} = -38 (\cos 42^\circ) = -28.234 \text{ N}$$

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

$$F_{2y} = -38 (\sin 42^\circ) = -25.442 \text{ N}$$

$$\cos 50^\circ = \frac{F_{3x}}{27}$$

$$F_{3x} = 27 (\cos 50^\circ) = 13.482 \text{ N}$$

$$\sin 50^\circ = \frac{F_{3y}}{-27}$$

$$F_{3y} = -27 (\sin 50^\circ) = -16.086 \text{ N}$$

$$\Sigma F_x = -28.234 + 13.482 = -14.752 \text{ N}$$

$$\Sigma F_y = 25 - 25.442 \text{ N} - 16.086 = -16.508 \text{ N}$$

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

$$R = \sqrt{217.621 + 272.511}$$

$$R = \sqrt{490.132}$$

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

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

$$\theta = 48.215^\circ$$