



TRABAJO INDIVIDUAL

ALUMNA: ANA CRISTELL GÓMEZ RODRÍGUEZ

MAESTRO: PEDRO ALBERTO GARCIA LOPEZ

MATERIA: ESTÁTICA PARA LA ARQUITECTURA

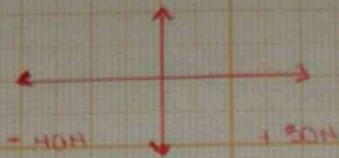
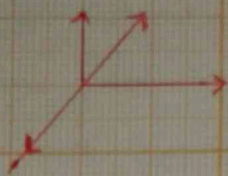
3ER PARCIAL, 3ER CUATRIMESTRE

TEMA: TRABAJO INDIVIDUAL

COMITAN DE COMINGUEZ CHIAPAS

05 DE JULIO 2024

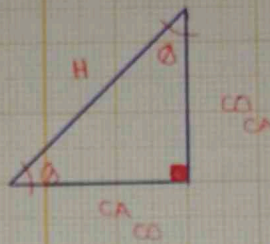
RESULTANTE DE FUERZAS CONCURRENTES



$$-40 + 50 = 10 \text{ N}$$

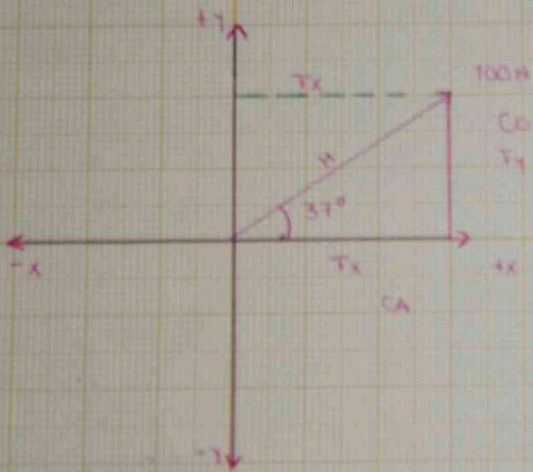
$$\text{Sen } \theta = \frac{CO}{H}$$

$$C = \sqrt{a^2 + b^2}$$



$$\text{Cos } \theta = \frac{CA}{H}$$

$$\text{Tan } \theta = \frac{CO}{CA}$$

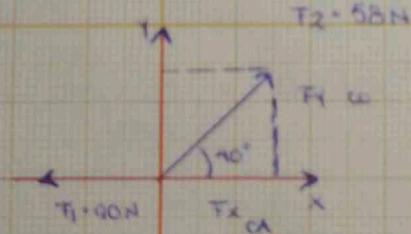


$$\text{Sen } 37^\circ = \frac{Ty}{100 \text{ N}}$$

$$Ty = 100 \text{ N} (\text{Sen } 37^\circ) = 60.18 \text{ N}$$

$$\text{Cos } 37^\circ = \frac{Tx}{100 \text{ N}}$$

$$Tx = 100 \text{ N} (\text{Cos } 37^\circ) = 79.86 \text{ N}$$

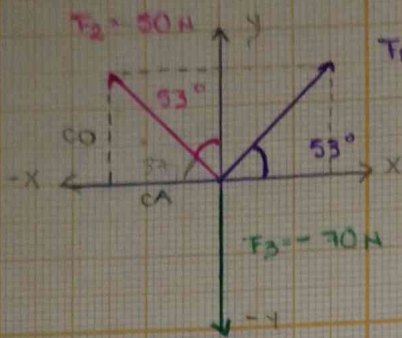


$$\text{Sen } 40^\circ = \frac{Ty}{58 \text{ N}} \rightarrow Ty = 58 \text{ N} (\text{Sen } 40^\circ) = 37.28 \text{ N}$$

$$\text{Cos } 40^\circ = \frac{Tx}{58 \text{ N}} \rightarrow Tx = 58 \text{ N} (\text{Cos } 40^\circ) = 44.43 \text{ N}$$

$$\Sigma Ty = 37.28 \text{ N}$$

$$\Sigma Tx = 44.43 \text{ N} + (-90 \text{ N}) = -45.57 \text{ N}$$



$$F_1 = 80 \text{ N}$$

$$\sin 53^\circ = \frac{F_y}{80 \text{ N}} \Rightarrow F_y = 80 \text{ N} (\sin 53^\circ) = 63.89 \text{ N}$$

$$\cos 53^\circ = \frac{F_x}{80 \text{ N}} \Rightarrow F_x = 80 \text{ N} (\cos 53^\circ) = 48.14 \text{ N}$$

F_2

$$\sin 37^\circ = \frac{F_y}{50 \text{ N}} \Rightarrow F_y = 50 \text{ N} (\sin 37^\circ) = 30.09 \text{ N}$$

$$\cos 37^\circ = \frac{F_x}{50 \text{ N}} \Rightarrow F_x = 50 \text{ N} (\cos 37^\circ) = 39.93 \text{ N}$$

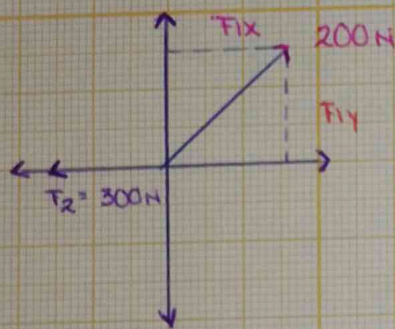
F_3 $F_y = -70 \text{ N}$

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

$$F_y = 23.98 \text{ N}$$

$$\Sigma F_x = 48.14 + 39.93$$

$$F_x = 88.07 \text{ N}$$

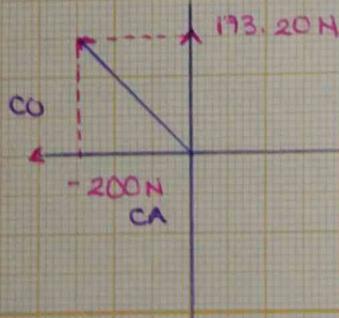


$$\sin 60^\circ = \frac{F_{1y}}{200 \text{ N}} \Rightarrow F_{1y} = 200 \text{ N} (\sin 60^\circ) = 173.20 \text{ N}$$

$$\cos 60^\circ = \frac{F_{1x}}{200 \text{ N}} \Rightarrow F_{1x} = 200 \text{ N} (\cos 60^\circ) = 100 \text{ N}$$

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

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



$$C = \sqrt{a^2 + b^2}$$

$$C = \sqrt{(-200 \text{ N})^2 + (173.20 \text{ N})^2}$$

$$C = \sqrt{40,000 \text{ N} + 29,998.24 \text{ N}}$$

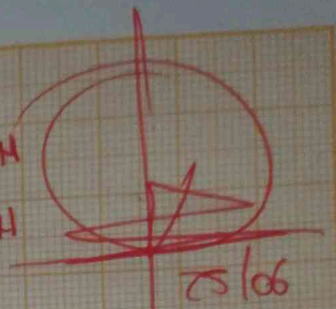
$$C = \sqrt{69,998.24 \text{ N}}$$

$$C = 264.57 \text{ N} = R$$

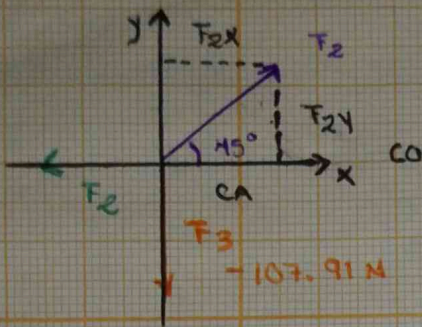
$$\tan \theta = \frac{173.20 \text{ N}}{-200 \text{ N}} = \theta = \tan^{-1} \frac{173.20 \text{ N}}{-200 \text{ N}} = -40.89$$

$$\tan \theta =$$

$$\theta = -40.89$$



25/06



$$1- \text{sen } 45^\circ = \frac{t_{2y}}{T_2} \rightarrow t_{2y} = T_2 (\text{sen } 45^\circ)$$

$$\text{cos } 45^\circ = \frac{t_{2x}}{T_2} \rightarrow t_{2x} = T_2 (\text{cos } 45^\circ)$$

$$2- \sum F_x = 0$$

$$-T_1 + T_2 (\text{cos } 45^\circ) = 0$$

$$-T_1 + T_2 (0.707) = 0$$

$$3- \sum F_y = 0$$

$$T_2 (\text{sen } 45^\circ) - 107.91 \text{ N} = 0$$

$$T_2 (\text{sen } 45^\circ) = 107.91 \text{ N} = 0$$

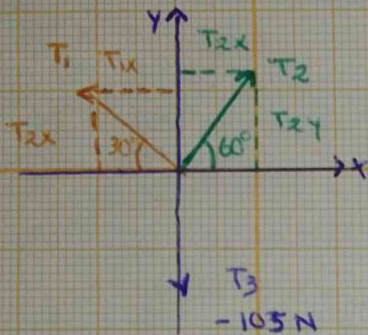
$$T_2 = \frac{107.91 \text{ N}}{\text{sen } 45^\circ}$$

$$T_2 = 152.60 \text{ N}$$

$$4- -T_1 + (152.60 \text{ N} \times 0.707) = 0$$

$$-T_1 + (106.82 \text{ N}) = 0$$

$$-T_1 = -106.82 \text{ N}$$



$$1- \text{sen } 30^\circ = \frac{T_{1y}}{T_1} \rightarrow T_{1y} = T_1 (\text{sen } 30^\circ)$$

$$\text{cos } 30^\circ = \frac{T_{1x}}{T_1} \rightarrow T_{1x} = T_1 (\text{cos } 30^\circ)$$

$$\text{sen } 60^\circ = \frac{T_{2y}}{T_2} \rightarrow T_{2y} = T_2 (\text{sen } 60^\circ)$$

$$\text{cos } 60^\circ = \frac{T_{2x}}{T_2} \rightarrow T_{2x} = T_2 (\text{cos } 60^\circ)$$

$$4- T_2 = 1.73 \cdot T_1$$

$$T_2 = 1.73 (53.03)$$

$$T_2 = 91.74 \text{ N}$$

$$\sum F_x = 0$$

$$T_2 \cdot \text{cos } 60^\circ - T_1 \cdot \text{cos } 30^\circ = 0$$

$$T_2 \cdot \text{cos } 60^\circ = T_1 \cdot \text{cos } 30^\circ$$

$$T_2 = T_1 \cdot \frac{\text{cos } 30^\circ}{\text{cos } 60^\circ}$$

$$T_2 = 1.73 \cdot T_1$$

$$\sum F_y = 0$$

$$T_1 \cdot \text{sen } 30^\circ + T_2 \cdot \text{sen } 60^\circ - 105 \text{ N} = 0$$

$$T_1 \cdot \text{sen } 30^\circ + (1.73 \cdot T_1) \cdot \text{sen } 60^\circ - 105 \text{ N} = 0$$

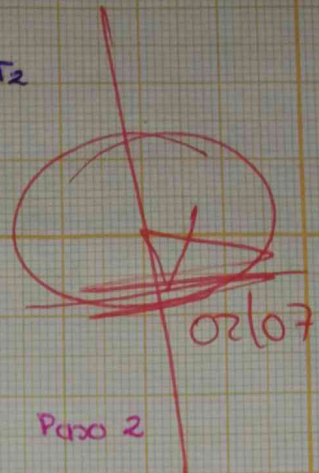
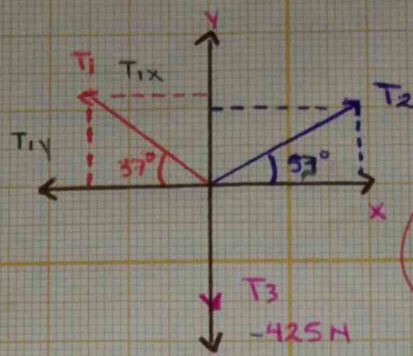
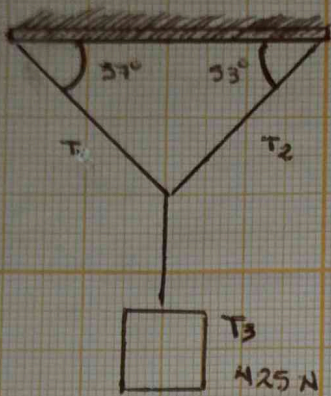
$$T_1 \cdot 0.5 + (1.73 \cdot T_1) \cdot 0.86 - 105 \text{ N} = 0$$

$$T_1 \cdot 0.5 + 1.48 \cdot T_1 - 105 \text{ N} = 0$$

$$T_1 = 1.98 - 105 \text{ N} = 0$$

$$T_1 = \frac{105 \text{ N}}{1.98}$$

$$T_1 = 53.03$$



Paso 1

$$\begin{aligned} \text{Sen } 37^\circ &= \frac{T_{1y}}{T_1} \rightarrow T_{1y} = T_1 (\text{sen } 37^\circ) \\ \text{Cos } 37^\circ &= \frac{T_{1x}}{T_1} \rightarrow T_{1x} = T_1 (\text{cos } 37^\circ) \end{aligned}$$

$$\begin{aligned} \text{sen } 53^\circ &= \frac{T_{2y}}{T_2} \rightarrow T_{2y} = T_2 (\text{sen } 53^\circ) \\ \text{cos } 53^\circ &= \frac{T_{2x}}{T_2} \rightarrow T_{2x} = T_2 (\text{cos } 53^\circ) \end{aligned}$$

Paso 3

$$\begin{aligned} \sum F_y &= 0 \\ T_1 \text{ sen } 37^\circ + T_2 \text{ sen } 53^\circ - 425 \text{ N} &= 0 \\ T_1 \text{ sen } 37^\circ + (1.32 \cdot T_1) \text{ sen } 53^\circ - 425 \text{ N} &= 0 \\ T_1 \cdot 0.60 + (1.32 \cdot T_1) \cdot 0.79 - 425 \text{ N} &= 0 \\ T_1 \cdot 0.60 + 1.04 \cdot T_1 - 425 \text{ N} &= 0 \\ (T_1 \cdot 1.64) - 425 \text{ N} &= 0 \\ T_1 &= \frac{425 \text{ N}}{1.64} = 259.15 \text{ N} \end{aligned}$$

Paso 2

$$\begin{aligned} \sum F_x &= 0 \\ T_2 \text{ cos } 53^\circ - T_1 \text{ cos } 37^\circ &= 0 \\ T_2 \text{ cos } 53^\circ &= T_1 \text{ cos } 37^\circ \\ T_2 &= T_1 \frac{\text{cos } 37^\circ}{\text{cos } 53^\circ} \\ T_2 &= 1.327 \cdot T_1 \end{aligned}$$

$$T_2 = 1.32 (259.15)$$

$$T_2 = 342.08 \text{ N}$$

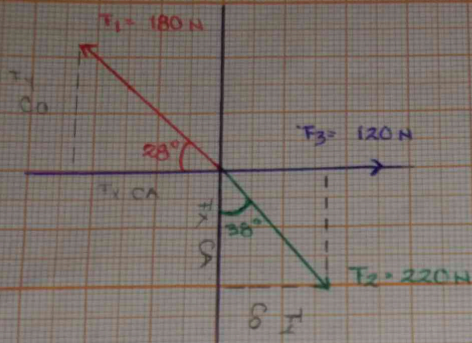


Figura 1

$$F_y = \text{sen } 28^\circ = F_y = 180 \text{ N} (\text{sen } 28^\circ) = 84.50 \text{ N}$$

$$F_{1x} = \text{cos } 28^\circ = F_x = 180 \text{ N} (\text{cos } 28^\circ) = 158.93$$

Figura 2

$$F_{2y} = \text{cos } 38^\circ = F_y = 220 \text{ N} (\text{cos } 38^\circ) = 173.36 \text{ N}$$

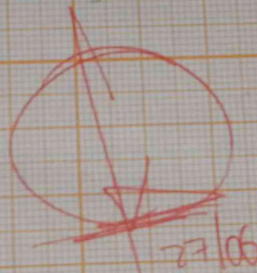
$$F_{2x} = \text{sen } 38^\circ = F_x = 220 \text{ N} (\text{sen } 38^\circ) = 135.44$$

$$\Sigma F_x = -158.93 + 135.44 + 120 \text{ N} = 96.51$$

$$\Sigma F_y = +84.50 \text{ N} - 173.36 \text{ N} = -88.86$$

Figura 3

$$F_{3x} = 120 \text{ N}$$



$$C = \sqrt{a^2 + b^2}$$

$$C = \sqrt{(96.51)^2 + (-88.86)^2}$$

$$C = \sqrt{9312.25 + 7896.09}$$

$$C = \sqrt{17208.34}$$

$$C = 131.16 \text{ N}$$

$$\tan \theta = \frac{-88.86}{96.51} = \theta \tan^{-1} = -88.86 = -42.63$$

$$\theta = 42.63$$

Paso 1

Figura 1

$$\begin{aligned} \text{Sen } 38^\circ = \frac{T_{1y}}{125\text{ N}} &\rightarrow T_{1y} = 125\text{ N} \cdot \text{sen } 38^\circ = 76.95\text{ N} \\ \text{Cos } 38^\circ = \frac{T_{1x}}{125\text{ N}} &\rightarrow T_{1x} = 125 \cdot \text{cos } 38^\circ = 98.50\text{ N} \end{aligned}$$

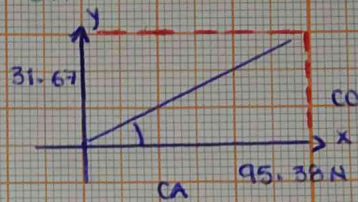
Figura 2

$$\text{Sen } 10^\circ = \frac{T_{2x}}{18\text{ N}} \rightarrow T_{2x} = 18\text{ N} \cdot \text{sen } 10^\circ = 3.12\text{ N}$$

$$\text{Cos } 10^\circ = \frac{T_{2y}}{18\text{ N}} \rightarrow T_{2y} = 18\text{ N} \cdot \text{cos } 10^\circ = 17.72\text{ N}$$

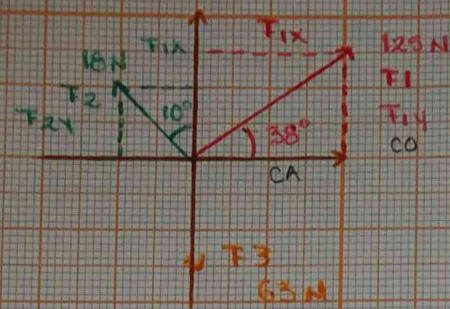
Figura 3

$$T_{3y} = 63\text{ N}$$



Paso 4

$$\tan \theta = \frac{31.67\text{ N}}{95.38\text{ N}} = \theta \text{ (tan}^{-1}\text{)} = \frac{31.67\text{ N}}{95.38\text{ N}} = 18.36^\circ$$



Paso 2

$$\sum F_x = 98.50\text{ N} - 3.12\text{ N} = 95.38\text{ N}$$

$$\sum F_y = 76.95\text{ N} + 17.72\text{ N} - 63\text{ N} = 31.67\text{ N}$$

Paso 3

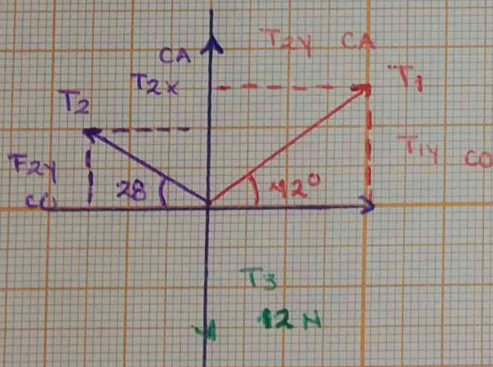
$$C = \sqrt{a^2 + b^2}$$

$$C = \sqrt{(95.38\text{ N})^2 + (31.67\text{ N})^2}$$

$$C = \sqrt{9097.34 + 1002.98}$$

$$C = \sqrt{10100.32}$$

$$C = 100.50$$



Paso 1

$$\text{Sen } 42^\circ = \frac{T_{1y}}{T_1} \rightarrow T_{1y} = T_1 \cdot \text{sen } 42^\circ$$

$$\text{Cos } 42^\circ = \frac{T_{1x}}{T_1} \rightarrow T_{1x} = T_1 \cdot \text{cos } 42^\circ$$

$$\text{Sen } 28^\circ = \frac{T_{2y}}{T_2} \rightarrow T_{2y} = T_2 \cdot \text{sen } 28^\circ$$

$$\text{Cos } 28^\circ = \frac{T_{2x}}{T_2} \rightarrow T_{2x} = T_2 \cdot \text{cos } 28^\circ$$

Paso 3

$$\sum F_y = 0$$

$$T_1 \cdot \text{sen } 42^\circ + T_2 \cdot \text{sen } 28^\circ - 12\text{ N} = 0$$

$$T_1 \cdot \text{sen } 42 + (0.84 \cdot T_1) \cdot \text{sen } 28^\circ - 12\text{ N} = 0$$

$$T_1 \cdot 0.669 + [(0.84 \cdot T_1) \cdot 0.469] - 12\text{ N} = 0$$

$$T_1 \cdot 0.669 + (0.39 \cdot T_1) - 12\text{ N} = 0$$

$$T_1 \cdot 1.059 - 12\text{ N} = 0$$

$$T_1 = \frac{12\text{ N}}{1.059} = 11.331\text{ N}$$

Paso 2

$$\sum F_x = 0$$

$$T_1 \cdot \text{cos } 42^\circ - T_2 \cdot \text{cos } 28^\circ = 0$$

$$T_2 = (T_1 \cdot \text{cos } 42^\circ) / \text{cos } 28^\circ$$

$$\text{cos } 28^\circ = 0.8829$$

$$T_2 = 0.84 \cdot T_1$$

Paso 4

$$T_2 = 0.84 (11.331)$$

$$T_2 = 9.518\text{ N}$$

Paso 1

Figura 1

$$\text{Sen } 15^\circ = \frac{F_{1y}}{105\text{N}} \rightarrow F_{1y} = 105\text{N} \cdot \text{sen } 15^\circ = 27.175\text{N}$$

$$\text{Cos } 15^\circ = \frac{F_{1x}}{105\text{N}} \rightarrow F_{1x} = 105\text{N} \cdot \text{cos } 15^\circ = 101.422\text{N}$$

Figura 2

$$\text{Sen } 37^\circ = \frac{F_{2y}}{110\text{N}} \rightarrow F_{2y} = 110\text{N} \cdot \text{sen } 37^\circ = 66.199\text{N}$$

$$\text{Cos } 37^\circ = \frac{F_{2x}}{110\text{N}} \rightarrow F_{2x} = 110\text{N} \cdot \text{cos } 37^\circ = 87.849\text{N}$$

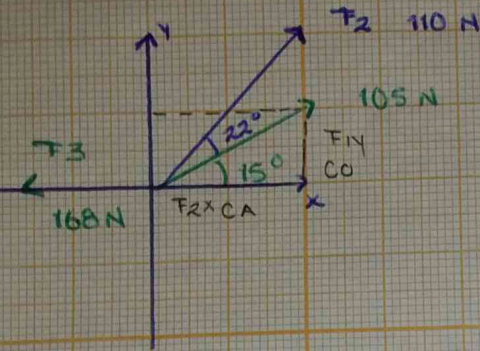
Figura 3

$$F_{3x} = -168\text{N}$$

Paso 4

$$\tan \theta = \frac{93.374\text{N}}{21.271\text{N}} = \theta \tan^{-1} = \frac{93.374\text{N}}{21.271\text{N}}$$

$$\theta \tan^{-1} = 77.16^\circ$$



Paso 2

$$\Sigma F_x = 101.422\text{N} + 87.849\text{N} - 168\text{N} = 21.271\text{N}$$

$$\Sigma F_y = 27.175\text{N} + 66.199\text{N} = 93.374\text{N}$$

Paso 3

$$C = \sqrt{a^2 + b^2}$$

$$C = \sqrt{(21.271\text{N})^2 + (93.374\text{N})^2}$$

$$C = \sqrt{452.455 + 8718.703}$$

$$C = \sqrt{9171.158}$$

$$C = 95.766$$

