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Nombre del trabajo: problemario

PASIÓN POR EDUCAR

Materia: Física 1

Grado: 4° cuatrimestre

Grupo: BRH05EMC0120-A

Comitán de Domínguez Chiapas a 14 de octubre de 2021.

1.- Sabiendo que $F_1 = 10\text{CM}$ $\alpha = 50^\circ$, $F_2 = 15\text{ CM}$ $\alpha = 90^\circ$, $F_3 = 9\text{ CM}$ $\alpha = 160^\circ$, $F_4 = 10\text{ CM}$ $\alpha = 250^\circ$. Calcula: $FR = F_1 + F_2 + F_3 + F_4$.

Encontrar f_x y f_y

$$F_{1x} = 10 \cos 50^\circ = 6.4279 \text{ cm}$$

$$F_{2x} = 15 \cos 90^\circ = 0 \text{ cm}$$

$$F_{3x} = 9 \cos 160^\circ = -8.4572 \text{ cm}$$

$$F_{4x} = 10 \cos 250^\circ = 3.4202 \text{ cm}$$

$$F_{1y} = 10 \sin 50^\circ = 7.6604 \text{ cm}$$

$$F_{2y} = 15 \sin 90^\circ = 15 \text{ cm}$$

$$F_{3y} = 9 \sin 160^\circ = 3.0781 \text{ cm}$$

$$F_{4y} = 10 \sin 250^\circ = -9.3969$$

$$F_x = f_{1x} + f_{2x} + f_{3x} + f_{4x} = -5.4495 \text{ cm}$$

$$F_y = f_{1y} + f_{2y} + f_{3y} + f_{4y} = 16.3916 \text{ cm}$$

Encontrar FR

$$FR = \sqrt{f_x^2 + f_y^2} = \sqrt{(-5.4495)^2 + (16.3916)^2}$$

$$\text{£ } FR = \sqrt{29.67 + 267.0479} = \sqrt{296.745}$$

$$\text{£ } FR = 17.2263 \text{ cm}$$

2.- Dados los vectores $V_1 = 5\text{ Cm}$ a 30° , $V_2 = 6\text{ Cm}$ a 60° , $V_3 = 2\text{ Cm}$ a 100° , $V_4 = 7\text{ Cm}$ a 150° ; Encuentra el vector resultante y su ángulo.

Encontrar V_X Y V_Y

$$V_{1X} = 5 \cos 30^\circ = 4.3301$$

$$V_{2X} = 6 \cos 60^\circ = 3$$

$$V_{3X} = 2 \cos 100^\circ = -0.3473$$

$$V_{4X} = 7 \cos 150^\circ = -6.0622$$

$$V_X = V_{1X} + V_{2X} + V_{3X} + V_{4X}$$

$$V_X = -9.206 \text{ cm}$$

$$V1Y = 5 \text{ SEN } 30^\circ = 2.5$$

$$V2Y = 6 \text{ SEN } 60^\circ = 5.1962$$

$$V3Y = 2 \text{ SEN } 100^\circ = 1.9696$$

$$V4Y = 7 \text{ SEN } 150^\circ = 3.5$$

$$VY = V1Y + V2Y + V3Y + V4Y$$

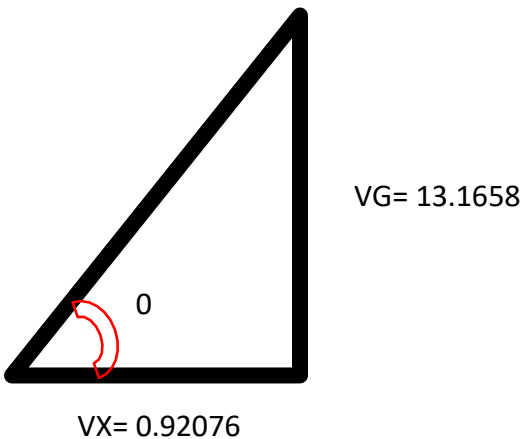
$$VY = 13.1658$$

ENCONTRAR VR

$$VR = \sqrt{VX^2 + VY^2} = \sqrt{(0.9206)^2 + (13.1658)^2} = \sqrt{0.8975 + 173.3383}$$

$$VR = \sqrt{174.2358} = 13.1980\text{cm}$$

ENCONTRAR ANGULO



$$\text{Tan } \theta = \frac{vg}{Vx} = \frac{13.1658}{0.9206} = 14.303$$

$$\frac{13.1658}{0.9206}$$

$$\text{Tan } \theta = (14.3013)$$

$$\theta = 86^\circ$$

3.- Del problema anterior encuentra la solución $VR = V4 + V2$.

$$V4Y = 7\text{cm a } 150^\circ$$

$$V2Y = 6\text{cm a } 60^\circ$$

$$V2Y = 6 \cos 60^\circ = 3$$

$$V4X = 7 \cos 150^\circ = -6.0622\text{cm}$$

$$VX = V2X + V4X = -3.0622\text{cm}$$

$$V_{2Y} = 6 \text{ SEN } 60^\circ = 5.1962 \text{ cm}$$

$$V_{4Y} = 7 \text{ SEN } 150^\circ = 3.5$$

$$V_Y = V_{2Y} + V_{4Y} = 8.6962 \text{ cm}$$

ENCONTRAR V_R

$$V_R = \sqrt{V_X^2 + V_Y^2} = \sqrt{(3.0622)^2 + (8.6962)^2} = \sqrt{9.3771 + 75.6239}$$

$$V_R = \sqrt{85.001} = 9.2196$$

Calcula la fuerza resultante de un sistema en el cual actúan las fuerzas: $F_1 = 1500 \text{ N}$ a 45° y $F_2 = 2500 \text{ N}$ a 120° , así como el ángulo de acción.

ENCONTRAR F_X Y F_Y

$$F_{1X} = 1500 \text{ COS } 45^\circ = 1060.6602 \text{ nw}$$

$$F_{2X} = 2500 \text{ COS } 120^\circ = -1250 \text{ nw}$$

$$F_X = 189.3398 \text{ nw}$$

$$F_{1Y} = 1500 \text{ SEN } (45^\circ) = 1060.66^\circ 2 \text{ nw}$$

$$F_{2Y} = 2500 \text{ SEN } (120^\circ) = 2165.0635 \text{ nw}$$

$$F_Y = 3225.7237 \text{ nw}$$

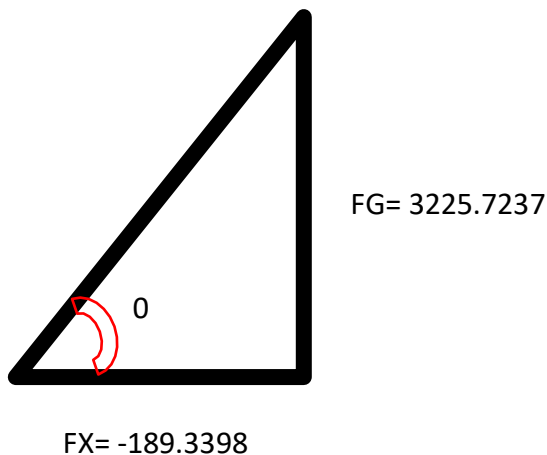
ENCONTRAR F_R

$$F_R = \sqrt{F_X^2 + F_Y^2} = \sqrt{(189.3398)^2 + (3225.7237)^2}$$

$$F_R = \sqrt{35849.5599 + 10405293.3888}$$

$$F_R = \sqrt{10441142.9487} = 3231.2758 \text{ nw}$$

ENCONTRAR ANGULO



$$\tan \theta = \frac{FY}{FX} = \frac{3225.7237}{-189.3393} = -17.0367$$

$$FX = -189.3393$$

$$\theta = \tan^{-1}(-17.0367)$$

$$\theta = -86.64^\circ$$

$$180^\circ + \theta = 93.36^\circ$$

$$\theta = 93.36^\circ$$