

PROBLEMARIO

27/04/23

Nota: Las Componentes de un Vector Son el desplazamiento de los ejes Coordinados hasta el final del vector

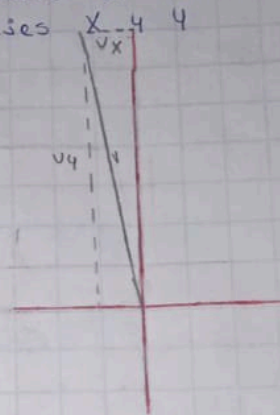
1. Sea un vector de 5cm con un ángulo de 100° , Calcula las respectivas Componentes en los ejes

$$V_x = 5\text{cm} \cos 100^\circ$$

$$V_x = -0.866$$

$$V_y = 5\text{cm} \sin 100^\circ$$

$$V_y = 4.92$$



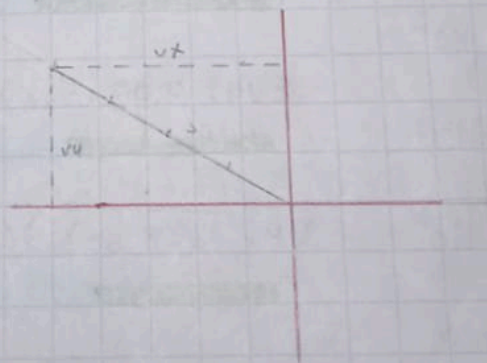
2. Sea un vector de 20cm con ángulo de 150° , Calcula las respectivas Componentes en los ejes

$$V_x = 20\text{cm} \cos 150^\circ$$

$$V_x = -17.32$$

$$V_y = 20\text{cm} \sin 150^\circ$$

$$V_y = 10$$



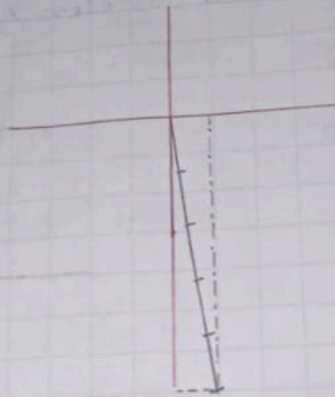
3: Sea un vector de 25cm con un ángulo de 280° . Calcula las respectivas componentes en los ejes X y Y.

$$V_x = 25 \text{ cm} \cos 280^\circ$$

$$V_x = 4.34$$

$$V_y = 25 \text{ cm} \sin 280^\circ$$

$$V_y = -24.6$$



4: Calcular el vector resultante y el ángulo del vector resultante de un sistema de vectores $V_1 = 10 \text{ cm } 85^\circ$, $V_2 = 5 \text{ cm } 110^\circ$, $V_3 = 8 \text{ cm } 200^\circ$.

$$V_1 = 10 \text{ cm} \cos 85^\circ$$

$$V_{1x} = 0.87 \text{ cm}$$

$$V_{1y} = 10 \text{ cm} \sin 85^\circ$$

$$V_{1y} = 9.96 \text{ cm}$$

$$V_2 = 5 \text{ cm} \cos 110^\circ$$

$$V_{2x} = -1.71 \text{ cm}$$

$$V_{2y} = 5 \text{ cm} \sin 110^\circ$$

$$V_{2y} = 4.69 \text{ cm}$$

$$V_3 = 8 \text{ cm} \cos 200^\circ$$

$$V_{3x} = -7.51 \text{ cm}$$

$$V_{3y} = 8 \text{ cm} \sin 200^\circ$$

$$V_{3y} = -2.73$$

$$\Sigma V_x = 0.87 + (-1.71) + (-7.51)$$

$$\Sigma V_x = -8.35$$

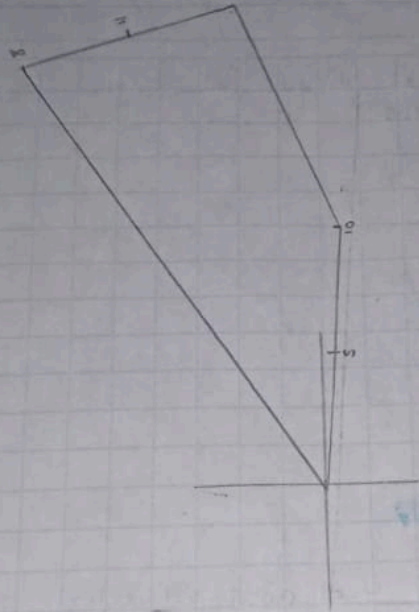
$$\Sigma V_y = 9.96 + 4.69 + (-2.73)$$

$$\Sigma V_y = 11.92$$

$$V_R = \sqrt{(-8.35)^2 + (11.92)^2}$$

$$V_R = 8.50$$

$$\alpha_{V_R} = \tan^{-1} \frac{\Sigma V_y}{\Sigma V_x} = \frac{11.92}{-8.35} = 54.98^\circ$$



5= Calcular el vector resultante y el ángulo del vector resultante de un sistema de vectores $V_1 = 10 \text{ cm } 45^\circ$ $V_2 = 15 \text{ cm } 100^\circ$

$V_3 = 8 \text{ cm } 210^\circ$

$V_{1x} = 10 \cos 45^\circ$

$V_{1x} = 7.07$

$V_{1y} = 10 \sin 45^\circ$

$V_{1y} = 7.07$

$V_{2x} = 15 \cos 100^\circ$

$V_{2x} = -2.60$

$V_{2y} = 15 \sin 100^\circ$

$V_{2y} = 14.77$

$V_{3x} = 8 \cos 210^\circ$

$V_{3x} = -6.92$

$V_{3y} = 8 \sin 210^\circ$

$V_{3y} = -4$

$\Sigma U_x = 7.07 - 2.60 - 6.92$

$\Sigma U_x = -16.09$

$\Sigma U_y = 7.07 + 14.77 + 4$

$\Sigma U_y = 17.84$

$V_R = \sqrt{(16.09)^2 + (17.84)^2}$

$V_R = 24.02$

$\alpha_{V_R} = \tan^{-1} \frac{\Sigma U_y}{\Sigma U_x} = \frac{17.84}{16.09}$

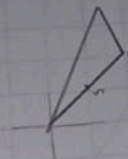
$\alpha_{V_R} = 47.9^\circ$



Cada cm
Vale 5

6= Calcular el vector resultante y el ángulo del vector
 Cuando $V_1 = 10\text{cm } 45^\circ$ $V_2 = 5\text{cm } 110^\circ$

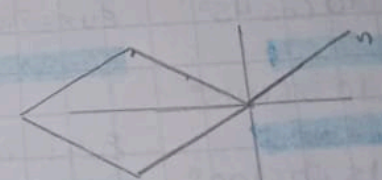
$$\begin{aligned}
 V_{1x} &= 10 \cos 45^\circ & E_{Vx} &= 7.07 + (-1.71) \\
 V_{1y} &= 10 \sin 45^\circ & E_{Vy} &= 5.36 \\
 V_{2x} &= 5 \cos 110^\circ & E_{Vx} &= 7.07 + 4.69 \\
 V_{2y} &= 5 \sin 110^\circ & E_{Vy} &= 11.36 \\
 V_{Rx} &= -1.71 & V_R &= \sqrt{(5.36)^2 + (11.36)^2} \\
 V_{Ry} &= 4.69 & V_R &= 12.92
 \end{aligned}$$



$$\alpha_{V_R \text{ TAN}} = \frac{E_{Vy}}{E_{Vx}} = \frac{11.36}{5.36} = 64.74^\circ$$

7= Calcular el vector resultante y el ángulo y el ángulo del vector
 resultante $V_1 = 5\text{cm } 35^\circ$ $V_2 = 5\text{cm } 150^\circ$

$$\begin{aligned}
 V_{1x} &= 5 \cos 210^\circ & V_R &= \sqrt{(8.66)^2 + (6)^2} \\
 V_{1y} &= 5 \sin 210^\circ & V_R &= 0 \\
 V_{2x} &= 5 \cos 150^\circ & \alpha_{V_R \text{ TAN}} &= \frac{E_{Vy}}{E_{Vx}} = \frac{0}{-8.66} \\
 V_{2y} &= 5 \sin 150^\circ & \alpha_{V_R} &= 0 \\
 V_{Rx} &= -4.33 & & \\
 V_{Ry} &= 2.5 & &
 \end{aligned}$$



$$\begin{aligned}
 E_{Vx} &= -4.33 + (-4.33) \\
 E_{Vx} &= -8.66
 \end{aligned}$$

$$\begin{aligned}
 E_{Vy} &= -2.5 + 2.5 \\
 E_{Vy} &= 0
 \end{aligned}$$