

Problemas Física

1. Calcular el vector resultante y el ángulo del vector resultante de un sistema de vectores en los que $V_1 = 10 \text{ cm } 85^\circ$; $V_2 = 5 \text{ cm } 110^\circ$
 $V_3 = 8 \text{ cm } 200^\circ$

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

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

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

$$V_{1x} = V_1 \cos \alpha$$

$$V_{1x} = 10 \text{ cm } \cos 85^\circ$$

$$V_{1x} = 0.87$$

$$V_{1y} = V_1 \sin 85^\circ$$

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

$$V_{1y} = 9.96$$

$$V_{2x} = V_2 \cos 110^\circ$$

$$V_{2x} = 5 \text{ cm } \cos 110^\circ$$

$$V_{2x} = -1.71$$

$$V_{2y} = V_2 \sin 110^\circ$$

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

$$V_{2y} = 4.69$$

$$V_{3x} = V_3 \cos 200^\circ$$

$$V_{3x} = 8 \text{ cm } \cos 200^\circ$$

$$V_{3x} = -7.51$$

$$V_{3y} = V_3 \sin 200^\circ$$

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

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

$$V_R = \sqrt{(\sum V_x)^2 + (\sum V_y)^2}$$

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

$$V_R = \sqrt{69.72 + 142.08}$$

$$V_R = \sqrt{211.8}$$

$$V_R = 14.55 \text{ cm}$$

$$\alpha = \tan^{-1} \frac{\sum V_y}{\sum V_x}$$

$$\alpha = \tan^{-1} \frac{-8.35}{11.92}$$

$$\alpha = \tan^{-1} -0.70$$

$$\alpha = -34.99^\circ$$

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

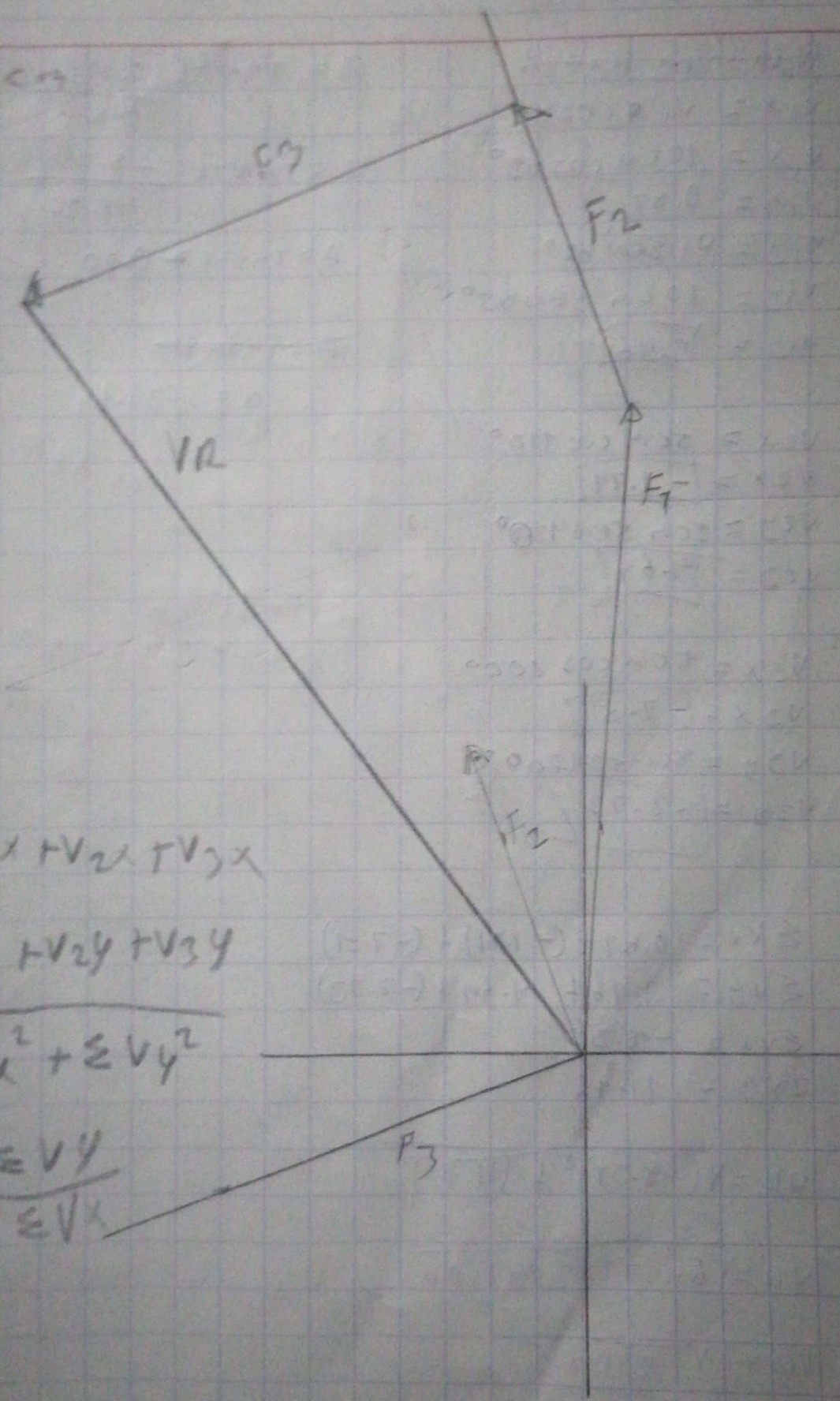
$$\sum V_x = -8.35$$

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

$$\sum V_y = 11.92$$

$$V_{R} = 14.5 \text{ cm}$$

$$\alpha = 127^\circ$$



$$V_{1x} =$$

$$V_{1y} =$$

$$V_{2x} =$$

$$V_{2y} =$$

$$V_{3x} =$$

$$V_{3y} =$$

$$\Sigma V_x = V_{1x} + V_{2x} + V_{3x}$$

$$\Sigma V_y = V_{1y} + V_{2y} + V_{3y}$$

$$V_R = \sqrt{\Sigma V_x^2 + \Sigma V_y^2}$$

$$\alpha = \tan^{-1} \frac{\Sigma V_y}{\Sigma V_x}$$

Problemas Física

2- Calcular el vector resultante y el ángulo del vector resultante de un sistema de vectores en las que $V_1 = 10 \text{ cm } 45^\circ$; $V_2 = 15 \text{ cm } 100^\circ$
 $V_3 = 8 \text{ cm } 270^\circ$

$$V_1 = 10 \text{ cm } 45^\circ \quad V_2 = 15 \text{ cm } 100^\circ \quad V_3 = 8 \text{ cm } 270^\circ$$

$$V_{1x} = V_1 \cos \alpha$$

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

$$V_{1x} = 7.07$$

$$V_{1y} = V_1 \sin \alpha$$

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

$$V_{1y} = 7.07$$

$$V_{2x} = V_2 \cos \alpha$$

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

$$V_{2x} = -2.60$$

$$V_{2y} = V_2 \sin \alpha$$

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

$$V_{2y} = 14.77$$

$$V_{3x} = V_3 \cos \alpha$$

$$V_{3x} = 8 \text{ cm } \cos 270^\circ$$

$$V_{3x} = -6.92$$

$$V_{3y} = V_3 \sin \alpha$$

$$V_{3y} = 8 \text{ cm } \sin 270^\circ$$

$$V_{3y} = -4$$

$$V_R = \sqrt{(\sum V_x)^2 + (\sum V_y)^2}$$

$$V_R = \sqrt{(-2.45)^2 + (17.84)^2}$$

$$V_R = \sqrt{6.0025 + 318.2656}$$

$$V_R = \sqrt{324.26}$$

$$V_R = 18.007 \text{ cm}$$

$$\alpha = \tan^{-1} \frac{\sum V_y}{\sum V_x}$$

$$\alpha = \tan^{-1} \frac{17.84}{-4}$$

$$\alpha = \tan^{-1} -7.28$$

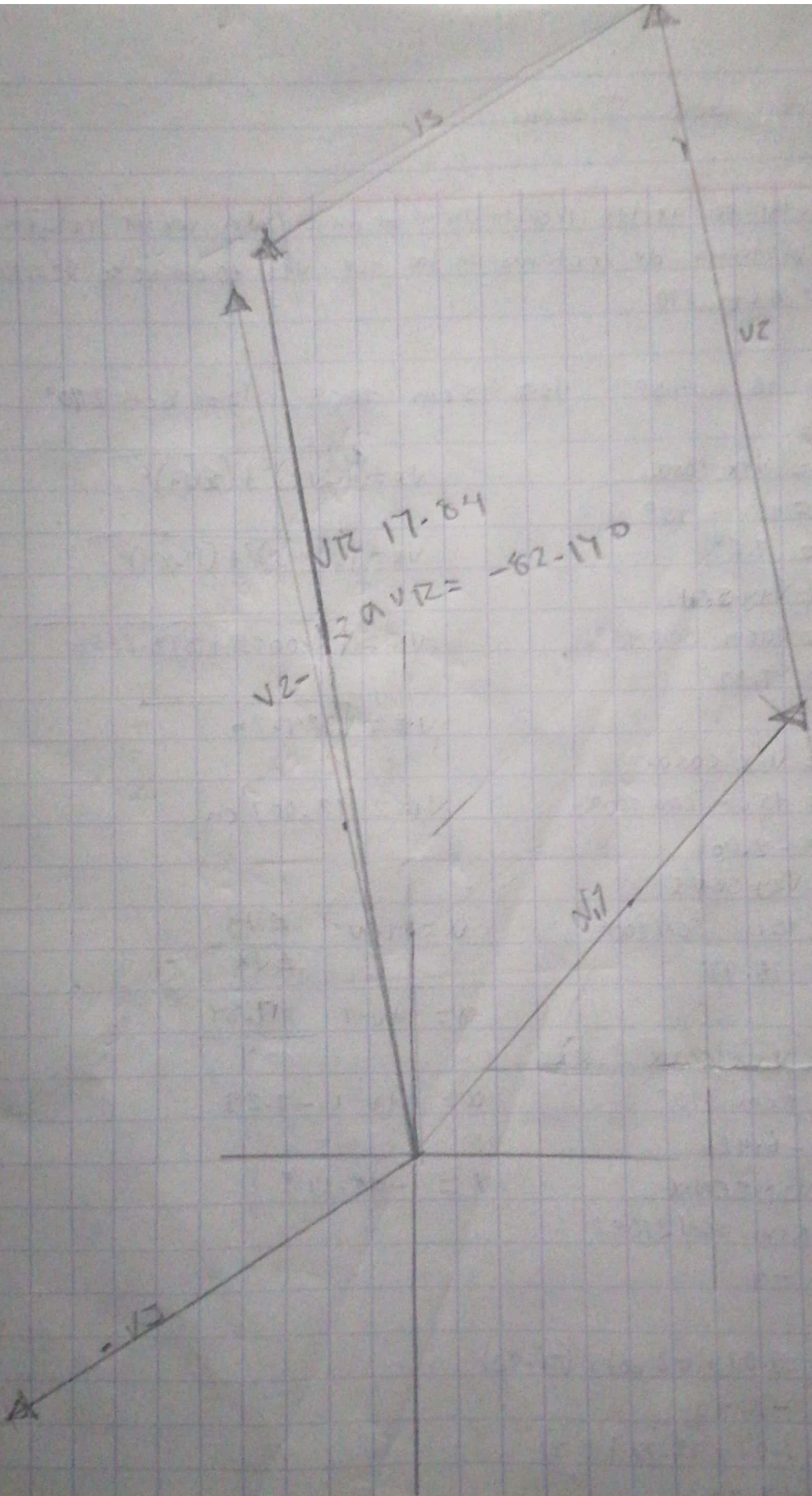
$$\alpha = -82.17^\circ$$

$$\sum V_x = 7.07 + (-2.60) + (-6.92)$$

$$\sum V_x = -2.45$$

$$\sum V_y = 7.07 + 14.77 + (-4)$$

$$\sum V_y = 17.84$$



Problemas Física

- 3- Calcular el vector resultante y el ángulo del vector resultante cuando $V_R = V_1 - V_2$ de un sistema de vectores en los que $V_1 = 10 \text{ cm } 45^\circ$; $V_2 = 5 \text{ cm } 110^\circ$

$$V_1 = 10 \text{ cm } 45^\circ \quad V_2 = 5 \text{ cm } 110^\circ$$

$$V_{1x} = V_1 \cos \alpha$$

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

$$V_{1x} = 7.07$$

$$V_{1y} = V_1 \sin \alpha$$

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

$$V_{1y} = 7.07$$

$$V_{2x} = V_2 \cos \alpha$$

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

$$V_{2x} = -1.71$$

$$V_{2y} = V_2 \sin \alpha$$

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

$$V_{2y} = 4.69$$

$$\Sigma V_x = 7.07 + (-1.71)$$

$$\Sigma V_x = 5.36$$

$$\Sigma V_y = 7.07 + 4.69$$

$$\Sigma V_y = 11.76$$

$$V_R = \sqrt{(5.36)^2 + (11.76)^2}$$

$$V_R = \sqrt{28.72 + 138.29}$$

$$V_R = \sqrt{167.01}$$

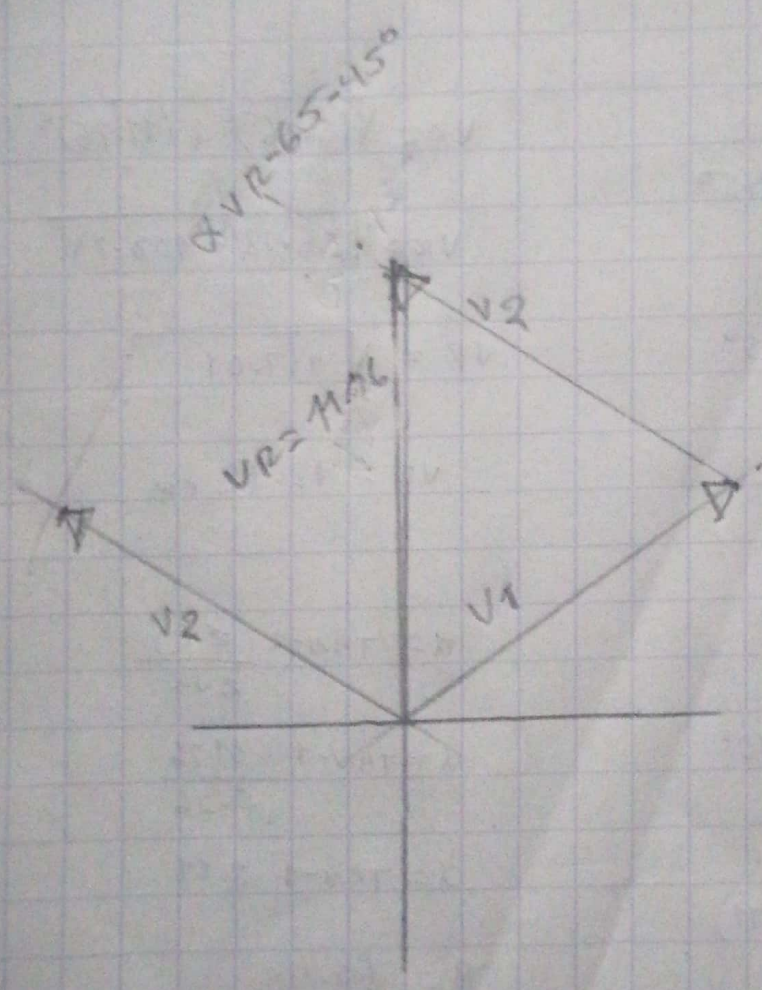
$$V_R = 12.92 \text{ cm}$$

$$\alpha = \tan^{-1} \frac{\Sigma V_y}{\Sigma V_x}$$

$$\alpha = \tan^{-1} \frac{11.76}{5.36}$$

$$\alpha = \tan^{-1} 2.19$$

$$\alpha = 65.45^\circ$$



Problemas Física

Calcular el vector resultante cuando $V_R = V_2 - V_1$ de un sistema de vectores en los que $V_1 = 5 \text{ cm } 30^\circ$; $V_2 = 5 \text{ cm } 150^\circ$

$$V_1 = 5 \text{ cm } 30^\circ$$

$$V_2 = 5 \text{ cm } 150^\circ$$

$$V_{1x} = V_1 \cos \alpha$$

$$V_{1x} = 5 \text{ cm } \cos 30^\circ$$

$$V_{1x} = 4.33$$

$$V_{1y} = V_1 \sin \alpha$$

$$V_{1y} = 5 \text{ cm } \sin 30^\circ$$

$$V_{1y} = 2.5$$

$$V_{2x} = V_2 \cos \alpha$$

$$V_{2x} = 5 \text{ cm } \cos 150^\circ$$

$$V_{2x} = -4.33$$

$$V_{2y} = V_2 \sin \alpha$$

$$V_{2y} = 5 \text{ cm } \sin 150^\circ$$

$$V_{2y} = 2.5$$

$$\Sigma V_x = 4.33 + (-4.33)$$

$$\Sigma V_x = 0$$

$$\Sigma V_y = 2.5 + 2.5$$

$$\Sigma V_y = 5$$

$$V_R = \sqrt{(0)^2 + (5)^2}$$

$$V_R = \sqrt{25}$$

$$V_R = 5 \text{ cm}$$

$$\alpha = \tan^{-1} \frac{5}{0}$$

$$\alpha = \text{INDETERMINADO}$$