

Problemas sobre vectores

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Resumen— Solución de problemas con vectores,

Problema 1

$$ay = A \sin \theta = 7.3 \text{sen}250 = -6.85$$

$$ax = A \cos \theta = 7.3 \cos 250 = -2.49$$

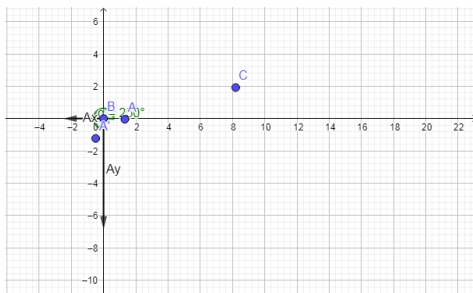


Figura 1. con expresion algebraica que con lleva cada función se conocen los valores Ax y Ay en el plano

$$\vec{A} \cdot \vec{B} = (4)(-1) + (-3)(1) + (1)(4) = -4 - 3 + 4 = -3$$

$$\cos \theta = \frac{\vec{A} \cdot \vec{B}}{|\vec{A}| |\vec{B}|} = \frac{-3}{(\sqrt{26})(\sqrt{18})} = \frac{-3}{\sqrt{468}} = \cos \theta^{-1} \left(\frac{-3}{\sqrt{468}} \right) = \theta = 97,97$$

$$|\vec{A}| = \sqrt{Ax^2 + Ay^2 + Az^2} = \sqrt{(4)^2 + (-3)^2 + (1)^2} = \sqrt{16 + 9 + 1} = \sqrt{26} = 5,09$$

$$|\vec{B}| = \sqrt{Bx^2 + By^2 + Bz^2} = \sqrt{(-1)^2 + (1)^2 + (4)^2} = \sqrt{1 + 1 + 16} = \sqrt{18} = 4,24$$

$$Ax\vec{B} = i[(-3)(4) - (1)(1)] - j[(4)(4) - (1)(-1)] + k[(4)(1) - (-3)(-1)] =$$

$$i[12 - 1] - j[16 + 1] + k[4 - 3] =$$

$$11i - 17j + k$$

Problema 2

$$= \sqrt{ax^2 + ay^2} = \sqrt{(-25)^2 + (40)^2} = \sqrt{625 + 1600}$$

$$\sqrt{2225} = 47.16$$

$$\tan \theta = \frac{Ay}{Ax} = \theta \tan^{-1} \left(\frac{40}{-25} \right) = -57.99^\circ$$

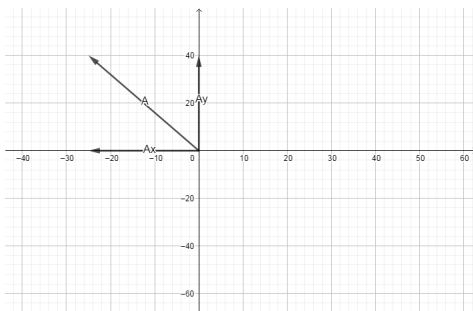


Figura 2. se muestran las expresiones de Ax y Ay para de esta forma tener nuestro vector

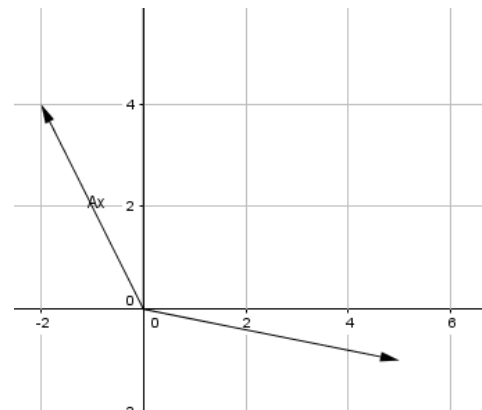


Figura 3. se conoce la dirección de A vector y B vector con los valores obtenidos.

Problema 3

$$\vec{A} = 4i - 3j + k \Rightarrow Ax = 4, Ay = -3, Az = 1$$

$$\vec{V} = -i + j + 4k \Rightarrow Bx = -1, By = 1, Bz = 4$$