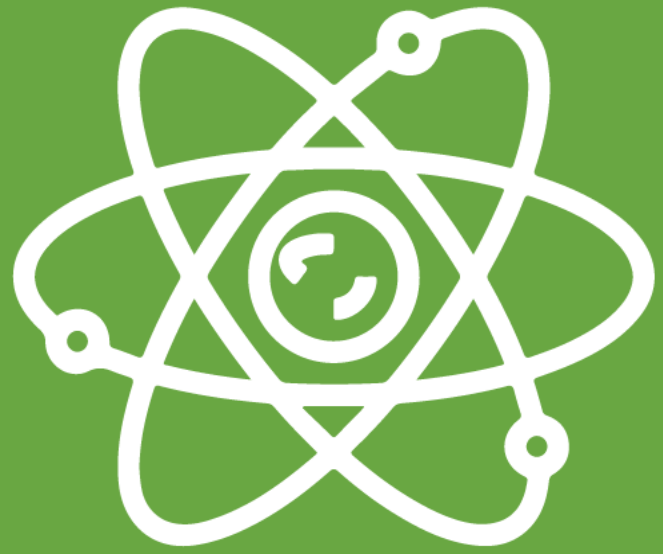
PHYSICS

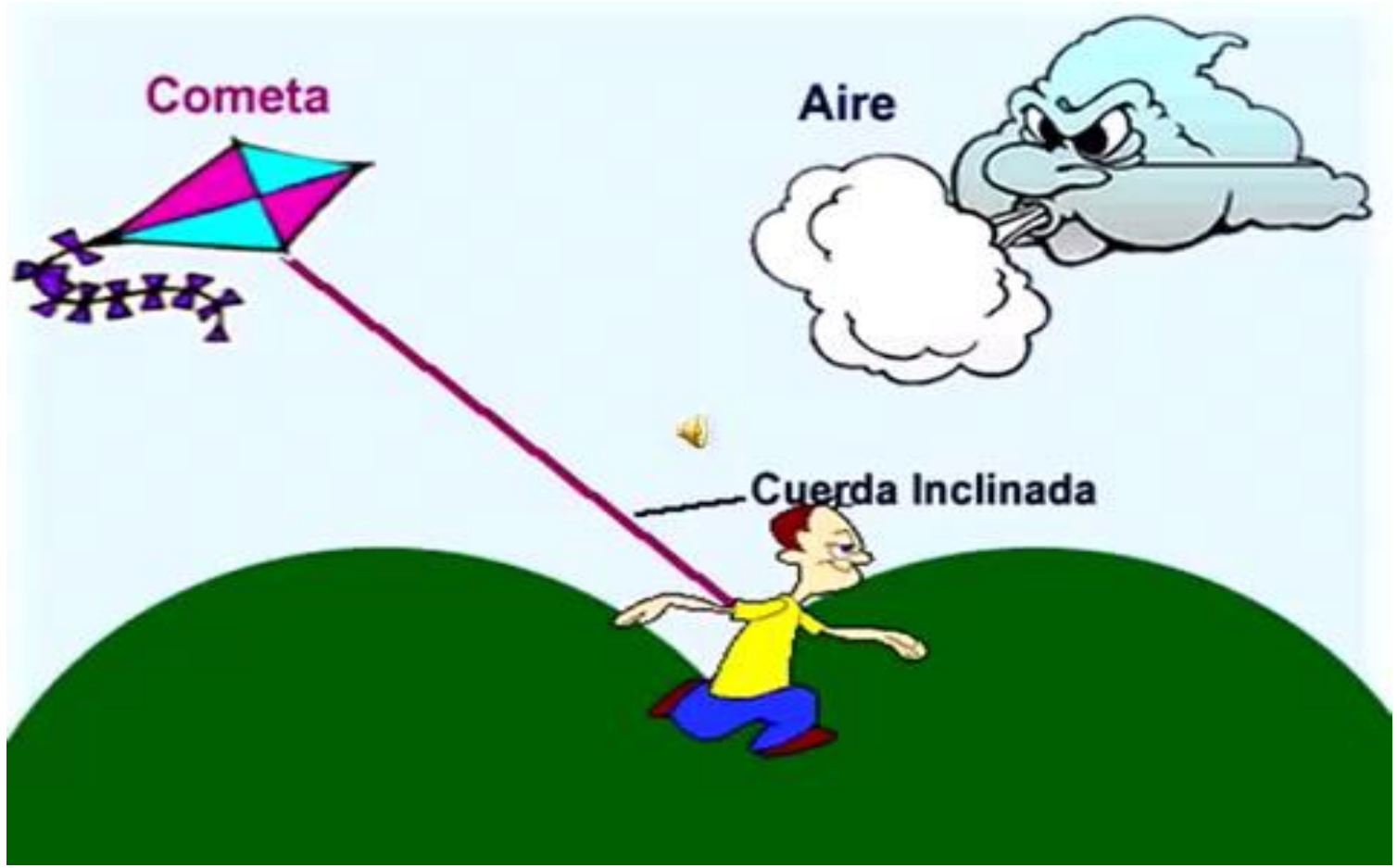
Chapter 11



VECTORES II

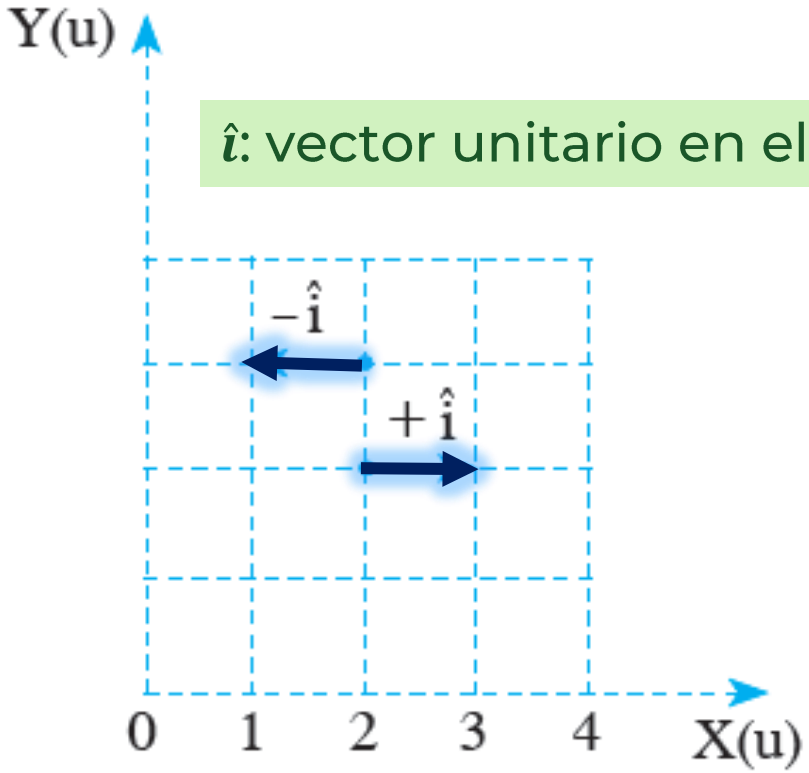
SACO OLIVEROS

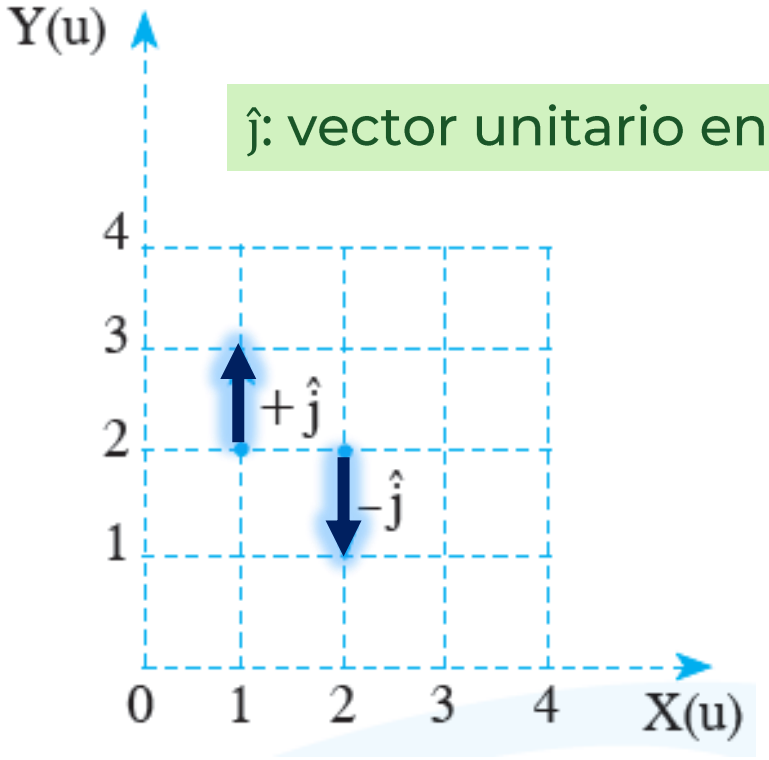
¿Dónde se suma los vectores?



VECTORES UNITARIOS CARTESIANOS

Son aquellos vectores cuyo **módulo es la unidad**. En los ejes coordenados X e Y son:

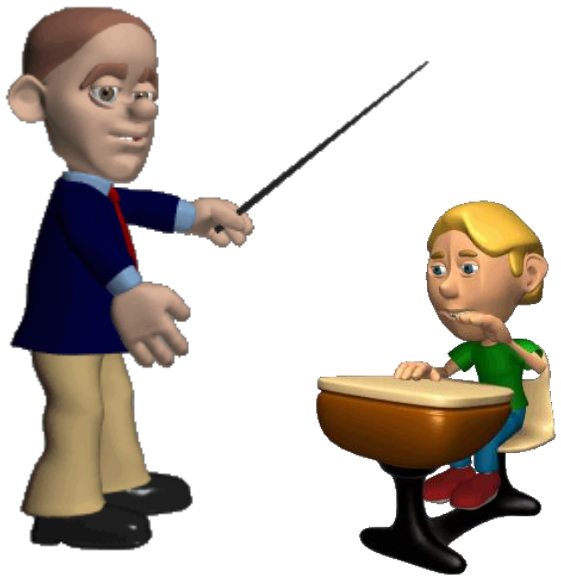




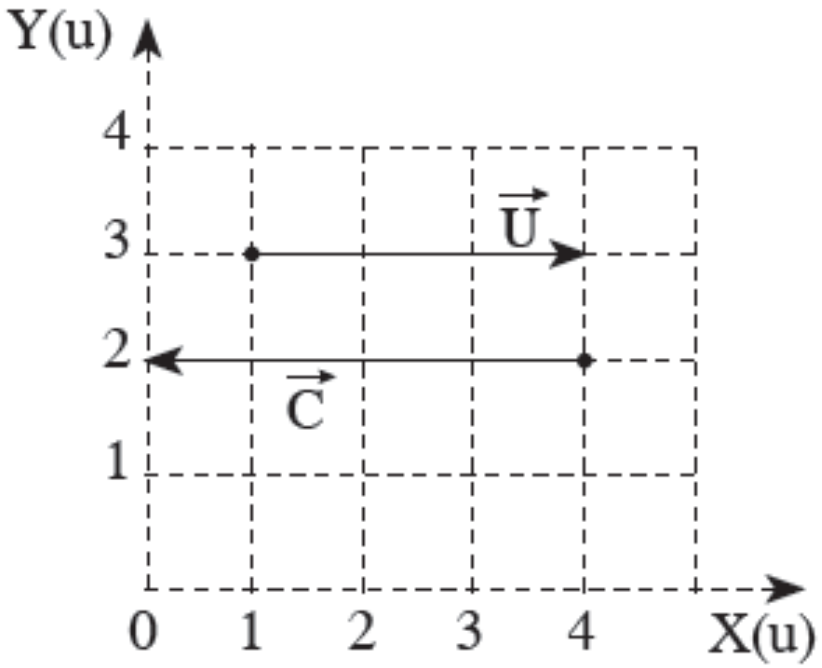
VECTOR RESULTANTE ($\vec{R}$)

- Representa a un conjunto de vectores.
- El vector resultante es la ADICIÓN del conjunto de vectores.

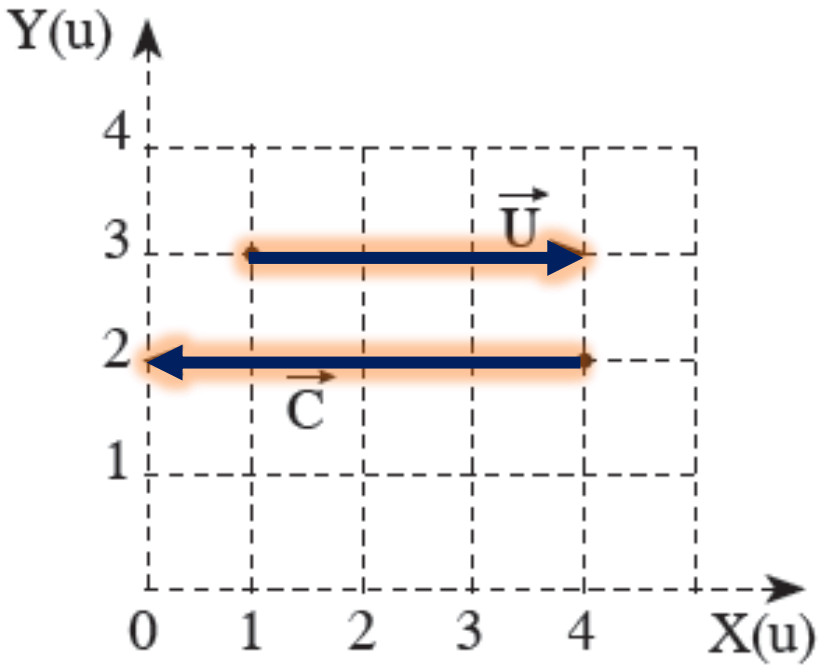
$$\vec{R} = \vec{a} + \vec{b} + \vec{c}$$



1 Exprese los vectores $\vec{U}$ y $\vec{C}$ en términos de los vectores $\hat{\imath}$ y $\hat{\jmath}$.



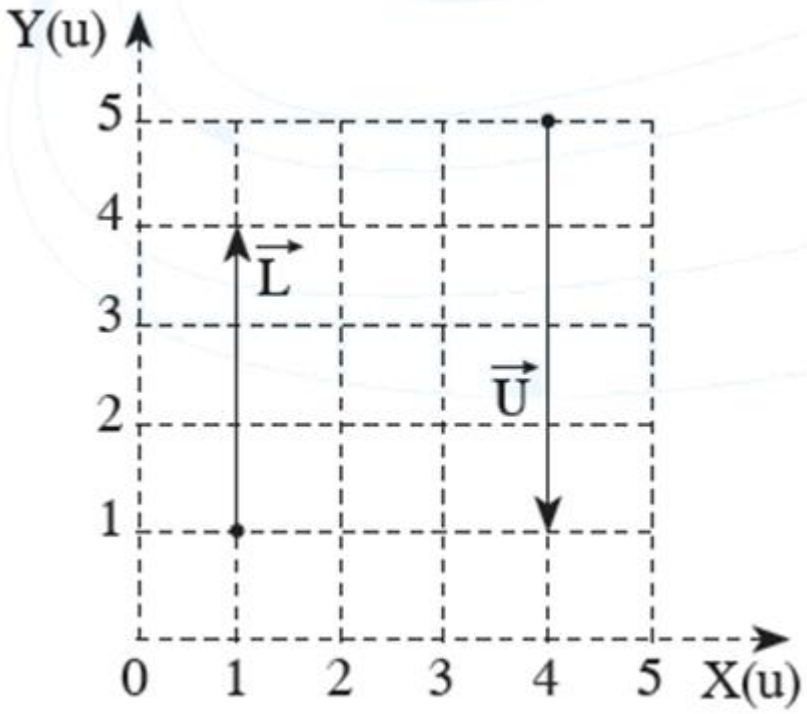
RESOLUCIÓN



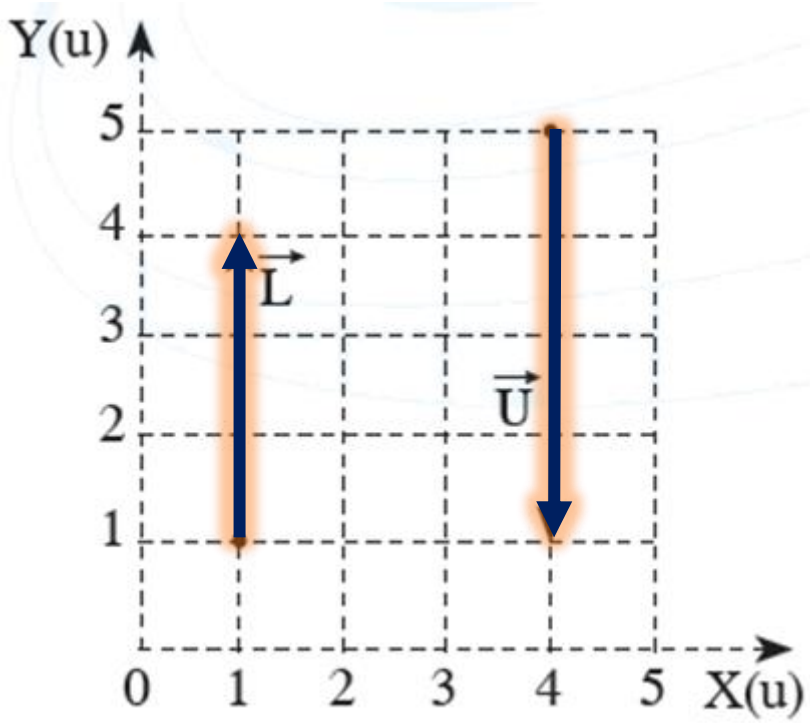
$$\vec{U} = 3(\hat{\imath})\ \text{u} = 3\hat{\imath}\ u$$

$$\vec{C} = 4(-\hat{\imath})\text{u} = -4\hat{\imath}\ u$$

2 Exprese los vectores $\vec{L}$ y $\vec{U}$ en términos de los vectores $\hat{\imath}$ y $\hat{\jmath}$.



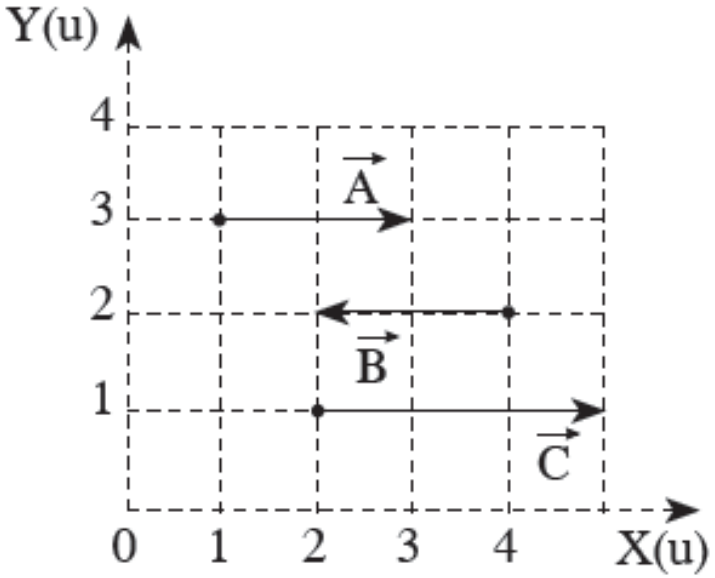
RESOLUCIÓN



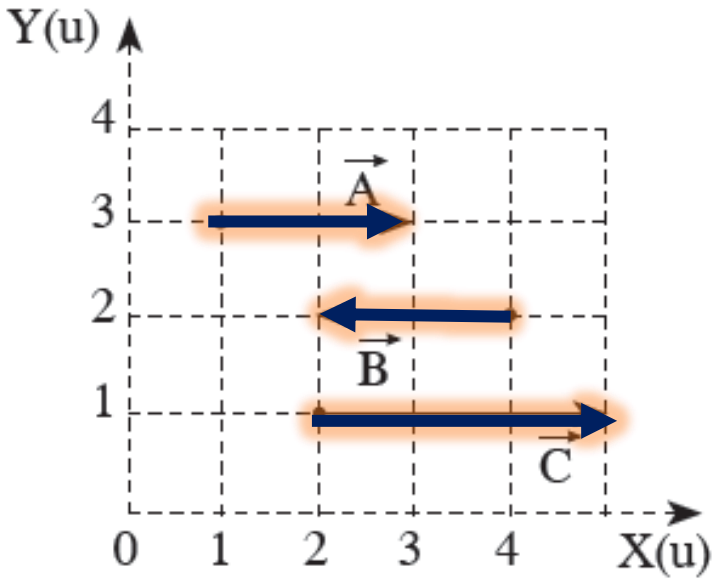
$$\vec{L} = 3(\hat{\jmath})\ \text{u} = 3\hat{\jmath}\ u$$

$$\vec{U} = 4(-\hat{\jmath})\ \text{u} = -4\hat{\jmath}\ u$$

3 Determine el vector resultante ($\vec{R} = \vec{A} + \vec{B} + \vec{C}$) del conjunto de vectores mostrados.



RESOLUCIÓN



$$\vec{A} = 2\hat{\imath}\ \text{u}$$

$$\vec{B} = -2\hat{\imath}\ \text{u}$$

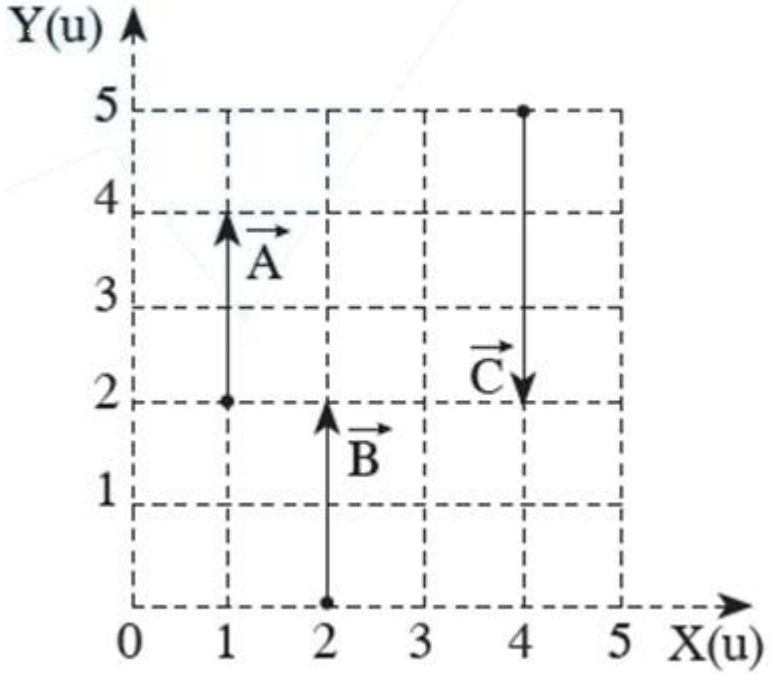
$$\vec{C} = 3\hat{\imath}\ \text{u}$$

$$\vec{R} = \vec{A} + \vec{B} + \vec{C}$$

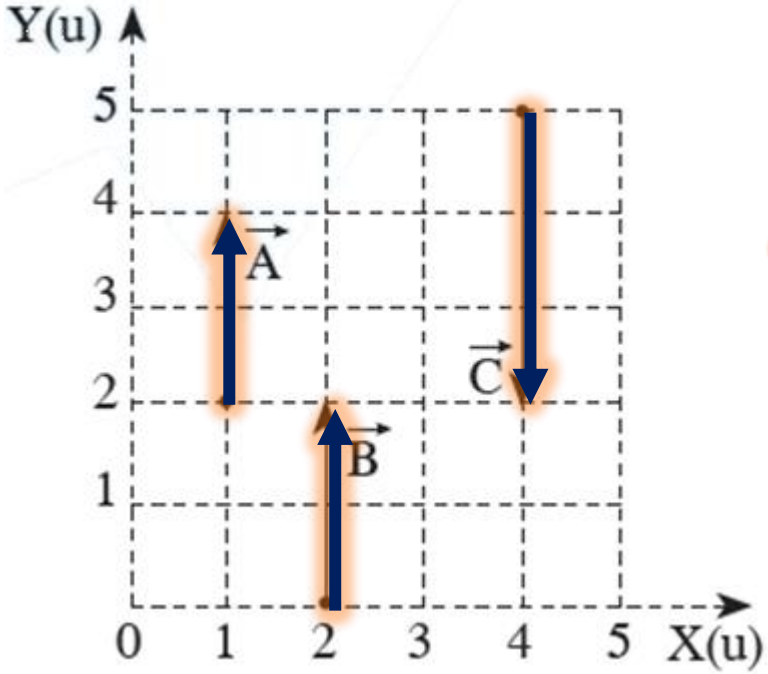
$$\vec{R} = 2\hat{\imath}\ \text{u} + (-2\hat{\imath}\ \text{u}) + 3\hat{\imath}\ \text{u}$$

$$\boxed{\vec{R} = 3\hat{\imath}\ u}$$

4 Determine el vector resultante $(\vec{R} = \vec{A} + \vec{B} + \vec{C})$ del conjunto de vectores mostrados.



RESOLUCIÓN



$$\vec{A} = 2\hat{j}\ \text{u}$$

$$\vec{B} = 2\hat{j}\ \text{u}$$

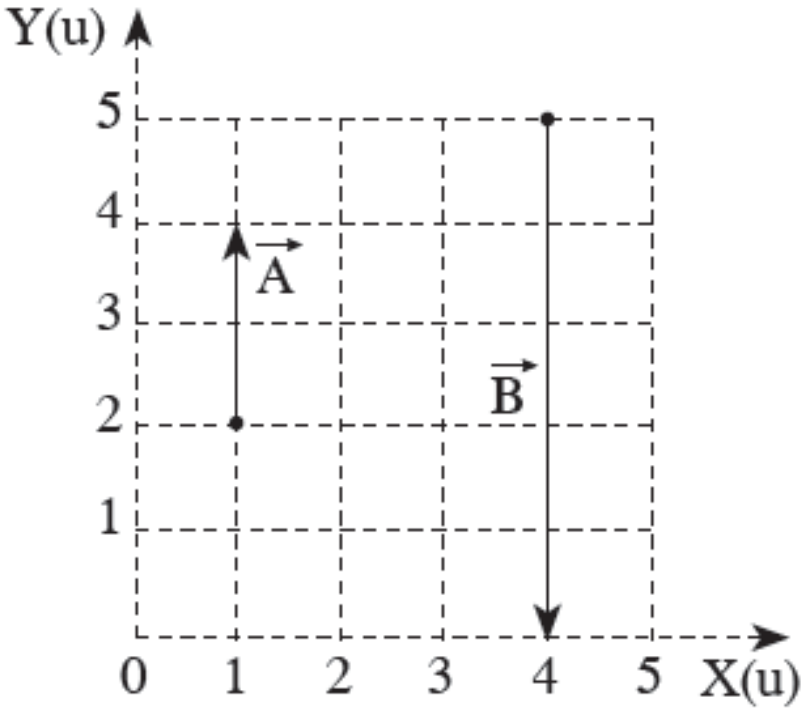
$$\vec{C} = -3\hat{j}\ \text{u}$$

$$\vec{R} = \vec{A} + \vec{B} + \vec{C}$$

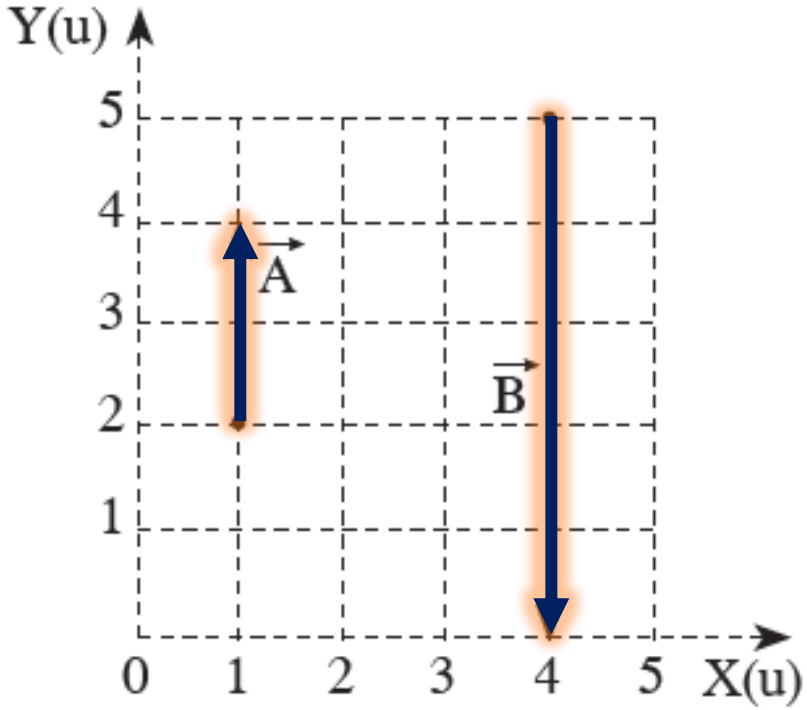
$$\vec{R} = (2\hat{j}\ \text{u}) + (2\hat{j}\ \text{u}) + (-3\hat{j}\ \text{u})$$

$$\vec{R} = 1\hat{j}\ u$$

5 Determine el módulo del vector resultante de los vectores mostrados.



RESOLUCIÓN



$\vec{A} = 2\hat{j}$ u

$\vec{B} = -5\hat{j}$ u

$\vec{R} = \vec{A} + \vec{B}$

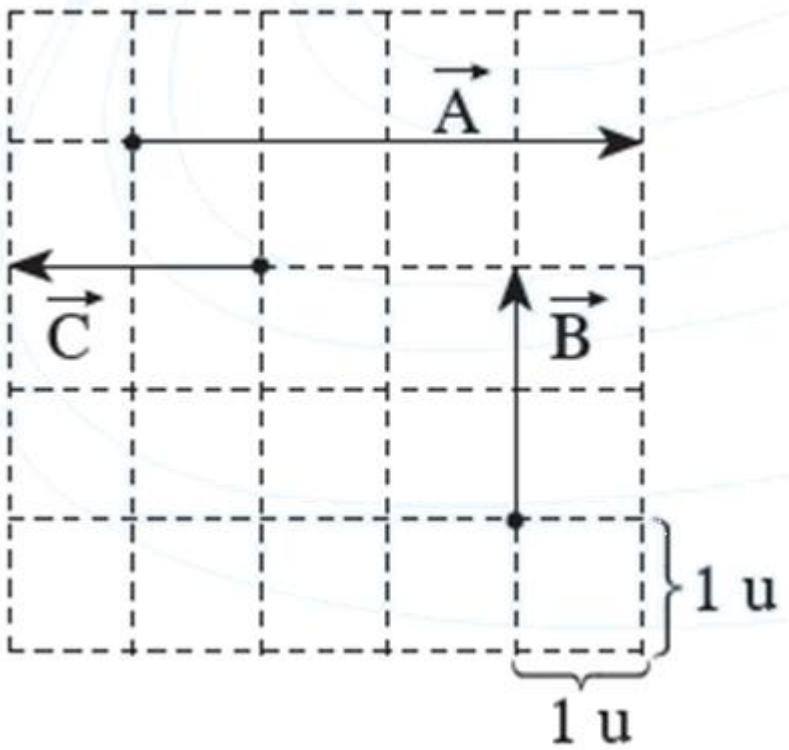
$\vec{R} = (2\hat{j}\ \text{u}) + (-5\hat{j}\ \text{u})$

módulo

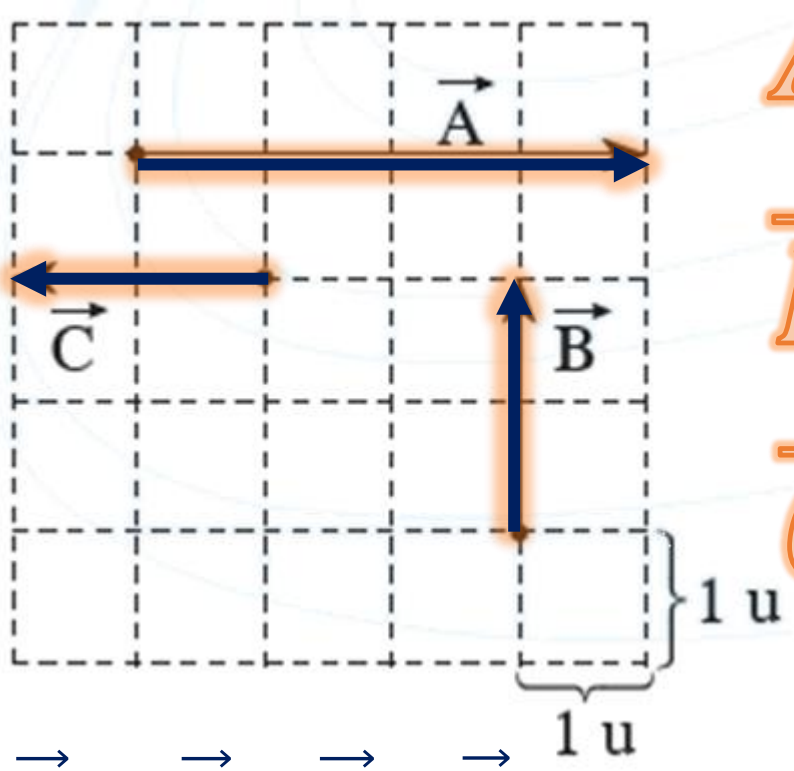
$\vec{R} = -3\hat{j}$ u

$R = 3\ u$

6 Determine el vector resultante del conjunto de vectores mostrados.



RESOLUCIÓN



$\vec{A} = 4\hat{i}$ u

$\vec{B} = 2\hat{j}$ u

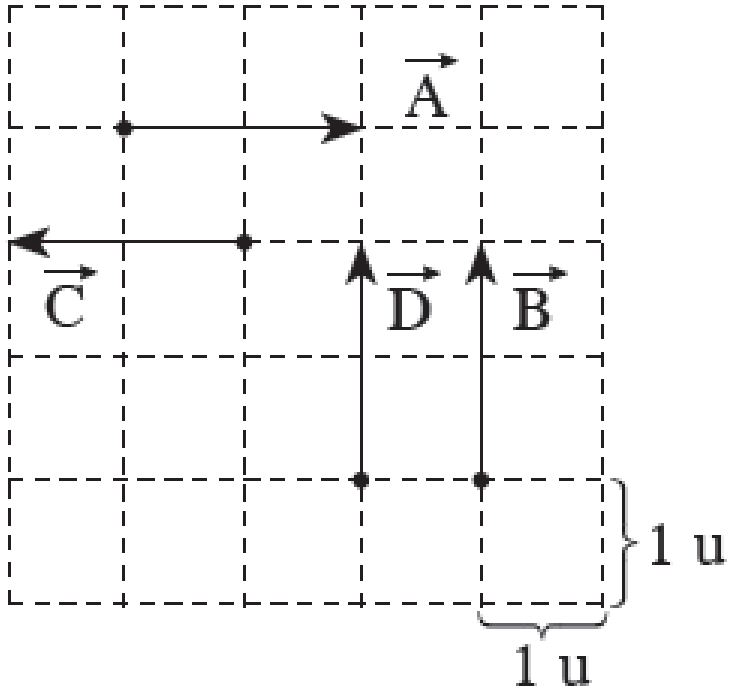
$\vec{C} = -2\hat{i}$ u

$\vec{R} = \vec{A} + \vec{B} + \vec{C}$

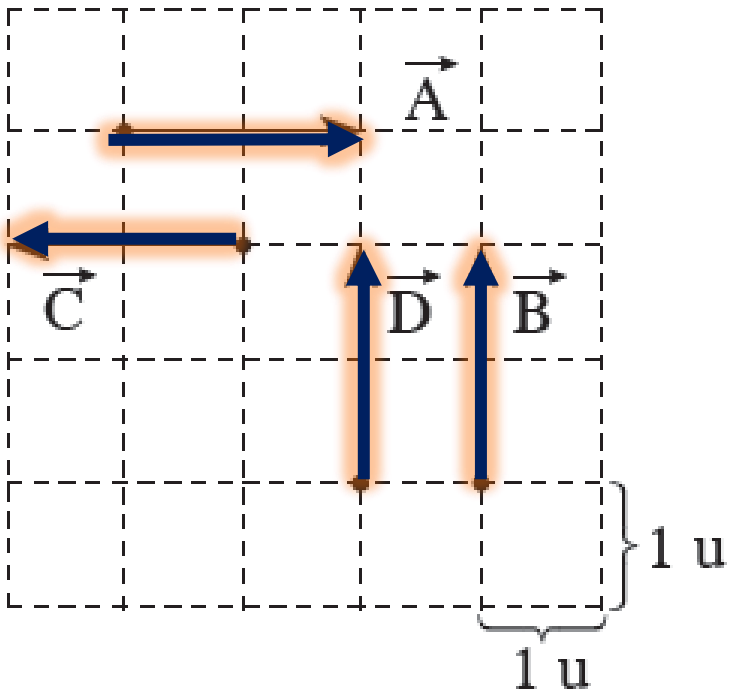
$\vec{R} = (4\hat{i}\text{u}) + (2\hat{j}\text{ u}) + (-2\hat{i}\text{u})$

$\vec{R} = 2\hat{i}\,u; 2\hat{j}\,u$

7 Determine el vector resultante del conjunto de vectores mostrados.



RESOLUCIÓN



$\vec{A} = 2\hat{i}$ u

$\vec{B} = 2\hat{j}$ u

$\vec{C} = -2\hat{i}$ u

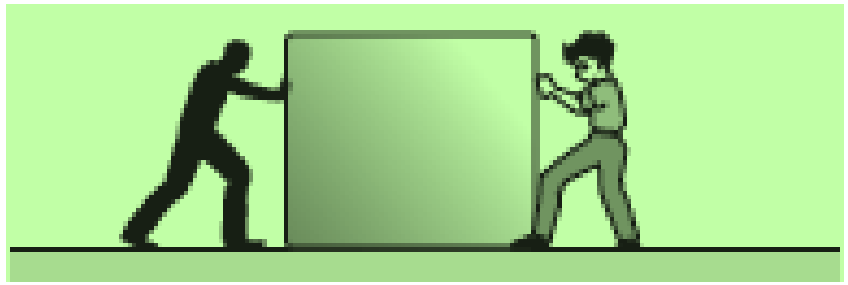
$\vec{D} = 2\hat{j}$ u

$$\vec{R} = \vec{A} + \vec{B} + \vec{C} + \vec{D}$$

$$\vec{R} = (\cancel{2\hat{i}}\text{u}) + (2\hat{j}\ \text{u}) + (\cancel{-2\hat{i}}\text{u})) + (2\hat{j}\ \text{u})$$

$$\vec{R} = 4\hat{j}\ u$$

8 Carlos y Miguel empujan la misma caja con una fuerza horizontal de 60 N y 40 N, respectivamente. Determine la fuerza resultante que actúa sobre la caja si las fuerzas se pueden representar mediante vectores.



RESOLUCIÓN

$$\overrightarrow{F_r} = 60\hat{\imath}N + (-40\ \hat{\imath}N)$$

$$\boxed{\overrightarrow{F_r} = 20\hat{\imath}N}$$

Se agradece su colaboración y participación durante el tiempo de la clase.