

Ejercicios de vectores:

1° Realizar las siguientes operaciones aritméticas:

- a) $(2, 3) + (1, 1) - (3, 2)$ b) $(1, -3) - (1, -1) - (2, 2)$ c) $(4, -3) - (6, -1) + (3, 2)$
 d) $(7, 10) + (1, 1) - (2, 2)$ e) $(3, 1) + (1, 3) - (2, 5)$ f) $(2, -1) + (-1, 3) + (1, 1)$

Sol: a) $(0, 2)$; b) $(-2, -4)$; c) $(1, 0)$; d) $(6, 9)$; e) $(2, -1)$; f) $(2, 3)$.

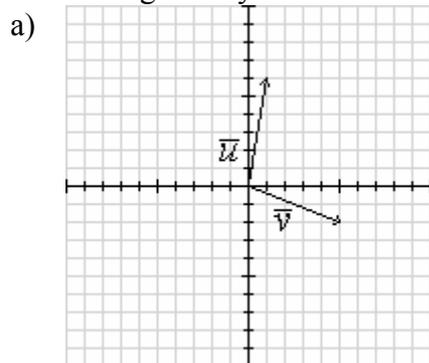
2° Realizar las siguientes operaciones aritméticas:

- a) $3 \cdot (2, 3)$ b) $5 \cdot (1, 2)$ c) $5 \cdot (6, -1)$ d) $-3 \cdot (4, -3)$

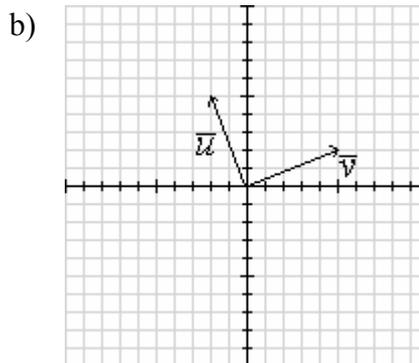
Sol: a) $(6, 9)$; b) $(5, 10)$; c) $(30, -5)$; d) $(-12, -9)$.

3° Observando las gráficas, determine en cada caso el valor de los vectores \vec{u} y \vec{v} .

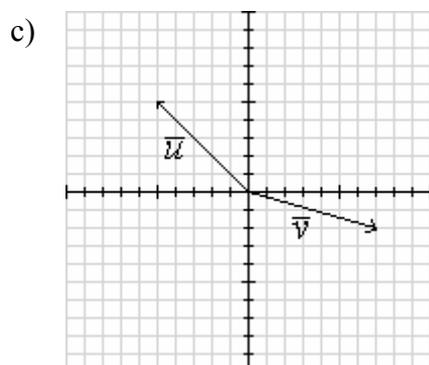
Determine gráfica y aritméticamente el vector $\vec{u} + \vec{v}$.



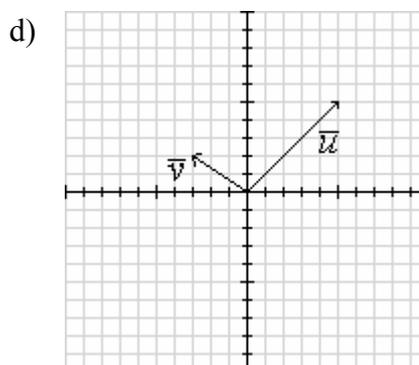
$\vec{u} =$ $\vec{v} =$
 $\vec{u} + \vec{v} =$



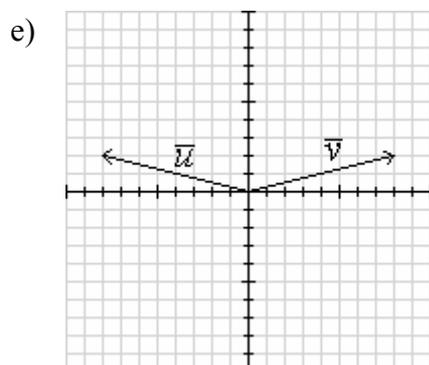
$\vec{u} =$ $\vec{v} =$
 $\vec{u} + \vec{v} =$



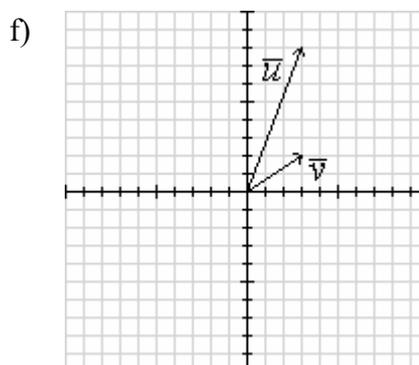
$\vec{u} =$ $\vec{v} =$
 $\vec{u} + \vec{v} =$



$\vec{u} =$ $\vec{v} =$
 $\vec{u} + \vec{v} =$

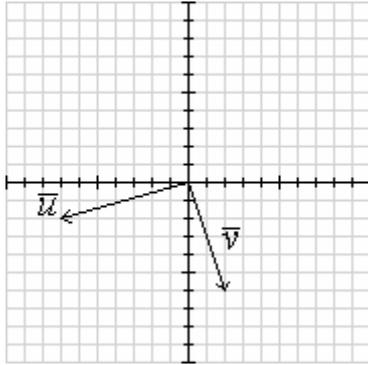


$\vec{u} =$ $\vec{v} =$
 $\vec{u} + \vec{v} =$



$\vec{u} =$ $\vec{v} =$
 $\vec{u} + \vec{v} =$

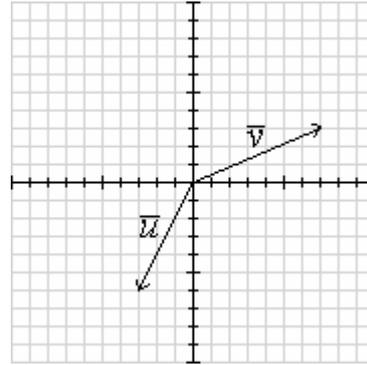
g)



$$\vec{u} = \quad \vec{v} =$$

$$\vec{u} + \vec{v} =$$

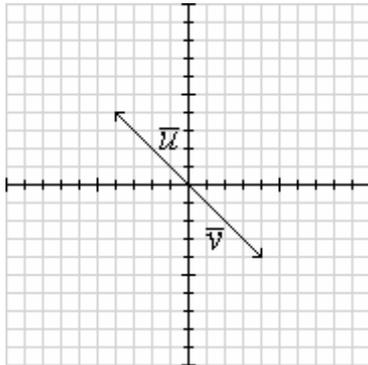
h)



$$\vec{u} = \quad \vec{v} =$$

$$\vec{u} + \vec{v} =$$

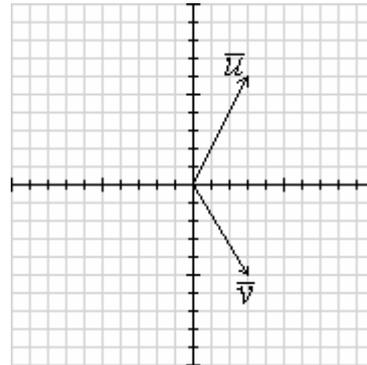
i)



$$\vec{u} = \quad \vec{v} =$$

$$\vec{u} + \vec{v} =$$

j)

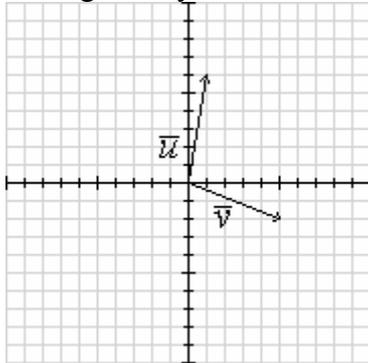


$$\vec{u} = \quad \vec{v} =$$

$$\vec{u} + \vec{v} =$$

4° Determine gráfica y aritméticamente los vectores diferencia que se indican.

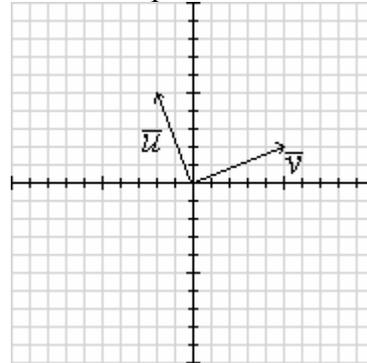
a)



$$\vec{u} = \quad \vec{v} =$$

$$\vec{u} - \vec{v} =$$

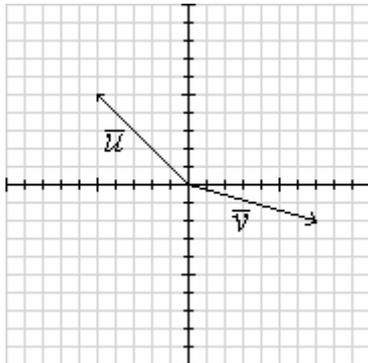
b)



$$\vec{u} = \quad \vec{v} =$$

$$\vec{u} - \vec{v} =$$

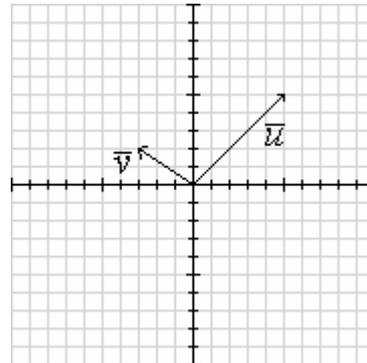
c)



$$\vec{u} = \quad \vec{v} =$$

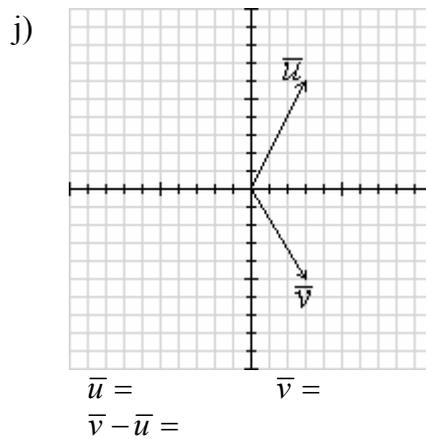
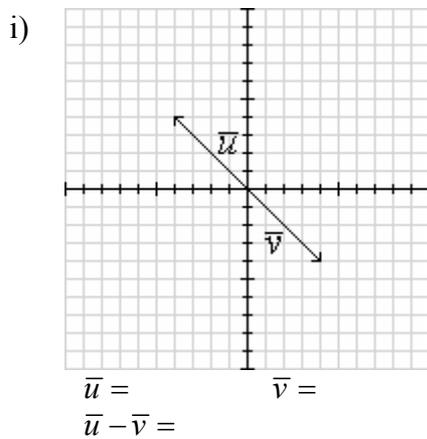
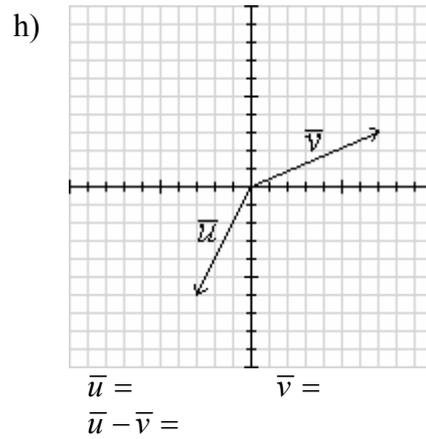
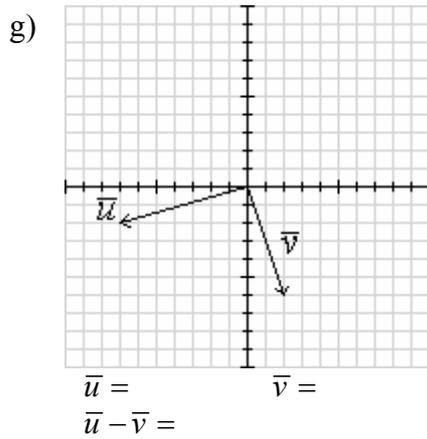
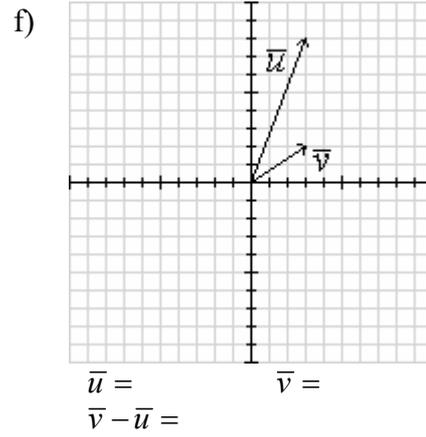
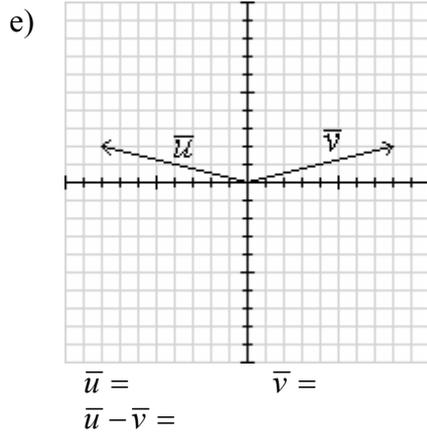
$$\vec{v} - \vec{u} =$$

d)

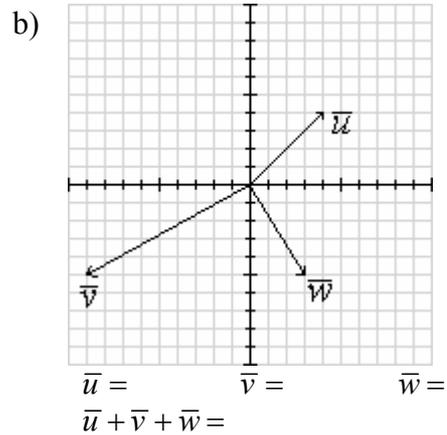
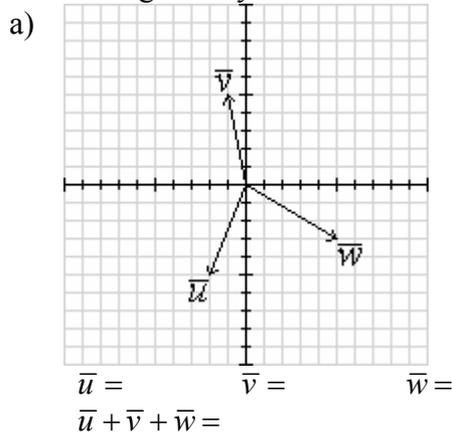


$$\vec{u} = \quad \vec{v} =$$

$$\vec{v} - \vec{u} =$$

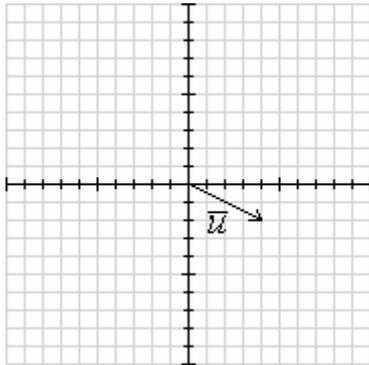


5° Determine gráfica y aritméticamente el vector $\vec{u} + \vec{v} + \vec{w}$.

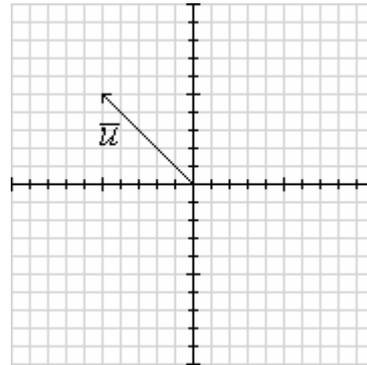


6° Dibuje en los gráficos las siguientes operaciones aritméticas realizadas a los vectores:

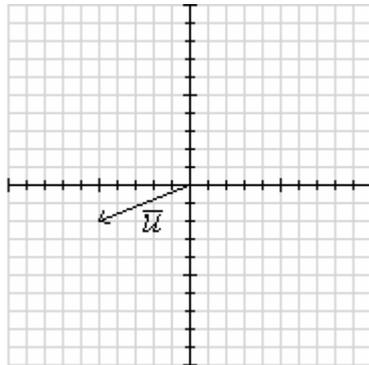
a) $2\cdot\vec{u} =$



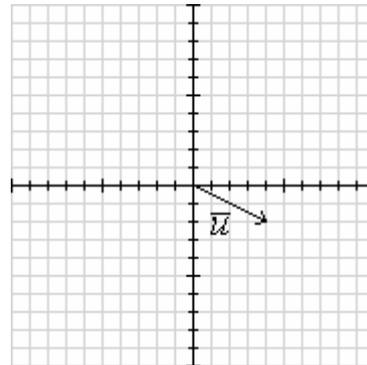
b) $\vec{u} / 5 =$



b) $-\vec{u} =$



c) $-2\cdot\vec{u} =$



7° Calcule el módulo y el argumento de los siguientes vectores:

a) $\vec{v} = (6, 0)$ b) $\vec{v} = (0, 3)$ c) $\vec{v} = (1, 2)$ d) $\vec{v} = (3, -4)$ e) $\vec{v} = (-2, -1)$

Sol: a) $|\vec{v}| = 6, \theta = 0^\circ$; b) $|\vec{v}| = 3, \theta = 90^\circ$; c) $|\vec{v}| = \sqrt{5}, \theta = 63.43^\circ$;

d) $|\vec{v}| = 5, \theta = -53.13^\circ$; e) $|\vec{v}| = \sqrt{5}, \theta = 206.56^\circ$.

8° Calcule el vector unitario de los siguientes vectores:

a) $\vec{v} = (6, 0)$ b) $\vec{v} = (0, 3)$ c) $\vec{v} = (1, 2)$ d) $\vec{v} = (3, -4)$ e) $\vec{v} = (-2, -1)$

Sol: a) $(1, 0)$; b) $(0, 1)$; c) $\left(\frac{1}{\sqrt{5}}, \frac{2}{\sqrt{5}}\right)$; d) $\left(\frac{3}{5}, \frac{-4}{5}\right)$; e) $\left(\frac{-2}{\sqrt{5}}, \frac{-1}{\sqrt{5}}\right)$.

9° Hallar un vector de módulo 10 en la dirección de $\vec{u} = (4, 3)$. **Sol:** $(8, 6)$.

10° Partiendo de los siguientes vectores:

$\vec{u} = (6, 0)$ $\vec{v} = (0, 3)$ $\vec{w} = (1, 2)$ $\vec{r} = (3, -4)$ $\vec{s} = (-2, -1)$

Calcule los siguientes productos escalares:

a) $\vec{u}\cdot\vec{v}$ b) $\vec{v}\cdot\vec{w}$ c) $\vec{s}\cdot\vec{u}$ d) $\vec{r}\cdot\vec{w}$ e) $\vec{r}\cdot\vec{s}$

Sol: a) 0; b) 6; c) -12; d) -5; e) -2.

11° Un vector tiene de módulo 4 y otro vector tiene módulo 5. Si el ángulo formado por los dos vectores es de 60° , calcule el producto escalar de los dos vectores. **Sol:** 10.