

Descomposición vectorial

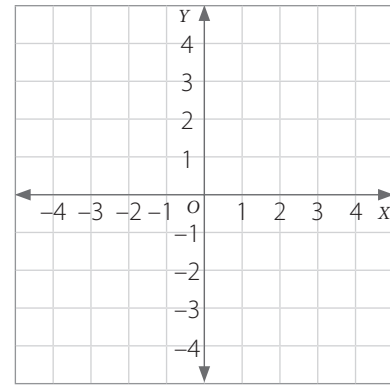
1. Calcula las componentes y representa en el plano cartesiano los siguientes vectores. Si es necesario, utiliza una calculadora y aproxima por redondeo a la décima.

a. $\vec{u} = (3\cos 70^\circ, -3\sin 70^\circ)$ $\vec{u} \approx \left(\quad , \quad \right)$

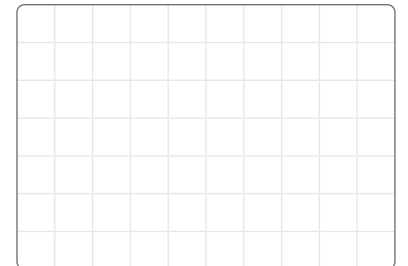
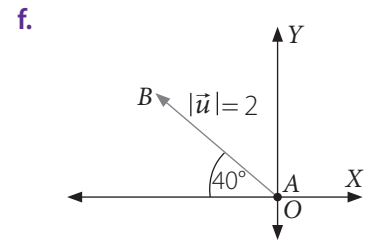
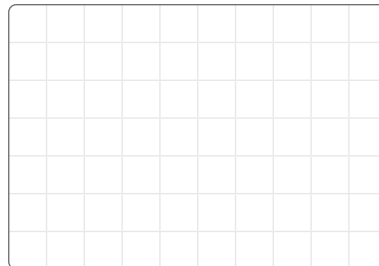
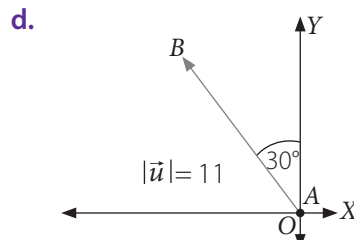
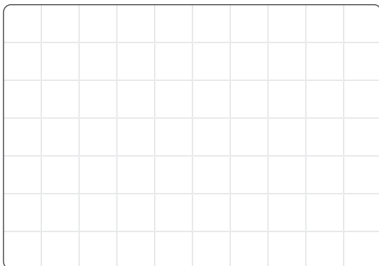
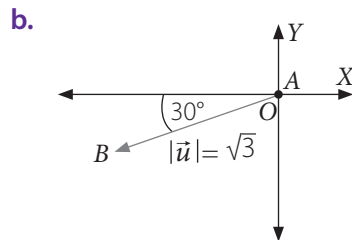
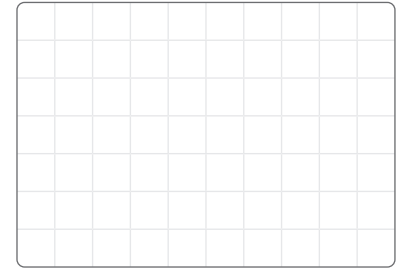
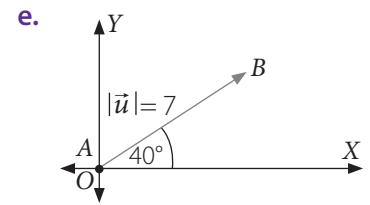
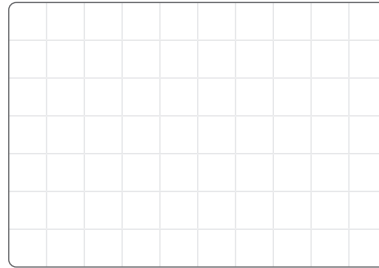
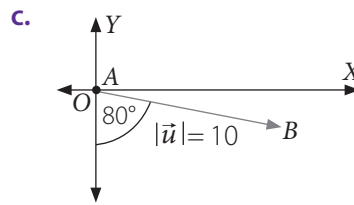
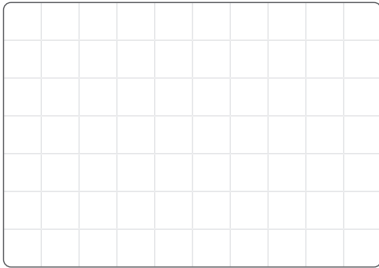
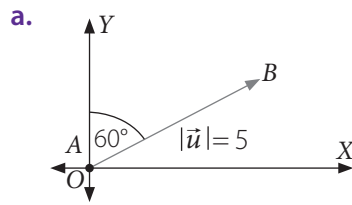
b. $\vec{v} = (-4\cos 45^\circ, 4\sin 45^\circ)$ $\vec{v} \approx \left(\quad , \quad \right)$

c. $\vec{w} = (2\cos 15^\circ, 2\sin 15^\circ)$ $\vec{w} \approx \left(\quad , \quad \right)$

d. $\vec{s} = \left(-\frac{\cos 65^\circ}{2}, -\frac{\sin 65^\circ}{2} \right)$ $\vec{s} \approx \left(\quad , \quad \right)$

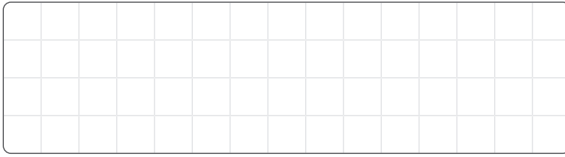


2. Calcula y señala las componentes de cada vector. Si es necesario, utiliza una calculadora y aproxima por redondeo a la décima.

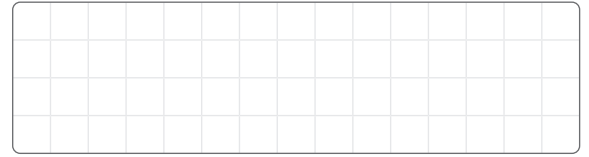


3. Calcula en cada caso la magnitud del vector a partir de sus componentes.

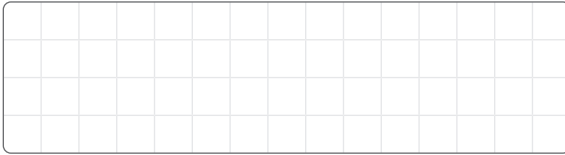
a. $v_x = 4; v_y = 5$ $\|\vec{v}\| =$



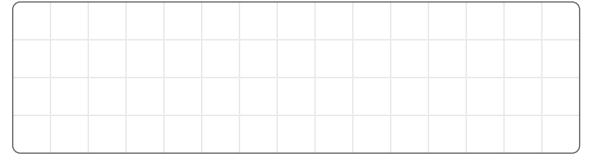
e. $v_x = 2; v_y = 8$ $\|\vec{v}\| =$



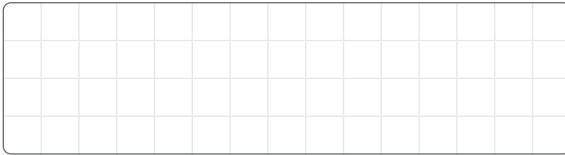
b. $v_x = -3; v_y = 2$ $\|\vec{v}\| =$



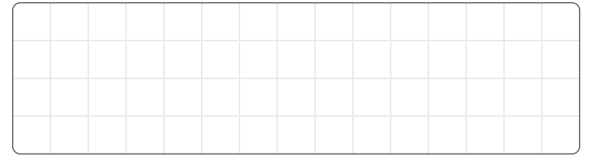
f. $v_x = 6; v_y = 7$ $\|\vec{v}\| =$



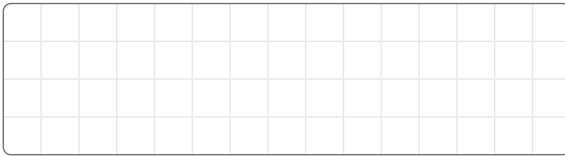
c. $v_x = 3; v_y = 6$ $\|\vec{v}\| =$



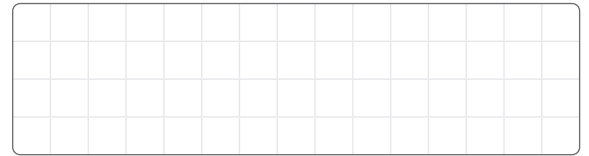
g. $v_x = -\frac{3}{5}; v_y = 4$ $\|\vec{v}\| =$



d. $v_x = -4; v_y = 25$ $\|\vec{v}\| =$





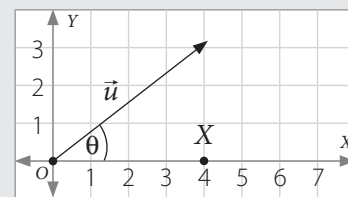
h. $v_x = -\frac{1}{4}; v_y = \frac{3}{5}$ $\|\vec{v}\| =$



4. Analiza la siguiente información. Luego, determina el ángulo que forma cada vector con el rayo OX.

El ángulo θ formado por el rayo OX y el vector $\vec{u} = (x, y)$ corresponde al valor de la función arcotangente, es decir:
 $\theta = \tan^{-1}\left(\frac{y}{x}\right)$. En la calculadora es la tecla \tan^{-1} y para calcular el ángulo θ , usas las teclas:

  $\left(\text{valor } y \div \text{valor } x \right) =$



a. $\vec{v} = (1, 6)$

$\theta =$

d. $\vec{v} = (7, -4)$

$\theta =$

g. $\vec{v} = (-3, 2)$

$\theta =$

b. $\vec{v} = (-2, 9)$

$\theta =$

e. $\vec{v} = (3, 6)$

$\theta =$

h. $\vec{v} = (-4, -4)$

$\theta =$

c. $\vec{v} = (-3, -1)$

$\theta =$

f. $\vec{v} = (-1, 1)$

$\theta =$

i. $\vec{v} = (2, -3)$

$\theta =$

Descomposición vectorial

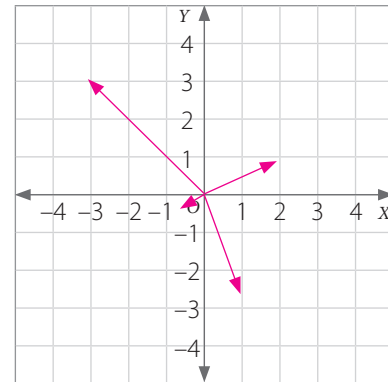
1. Calcula las componentes y representa en el plano cartesiano los siguientes vectores. Si es necesario, utiliza una calculadora y aproxima por redondeo a la décima.

a. $\vec{u} = (3\cos 70^\circ, -3\sin 70^\circ)$ $\vec{u} \approx \left(\boxed{1}, \boxed{-2,8} \right)$

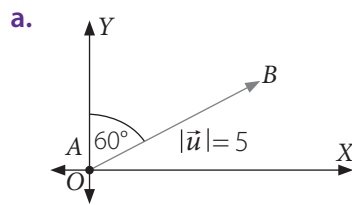
b. $\vec{v} = (-4\cos 45^\circ, 4\sin 45^\circ)$ $\vec{v} \approx \left(\boxed{-2,8}, \boxed{2,8} \right)$

c. $\vec{w} = (2\cos 15^\circ, 2\sin 15^\circ)$ $\vec{w} \approx \left(\boxed{1,9}, \boxed{0,5} \right)$

d. $\vec{s} = \left(-\frac{\cos 65^\circ}{2}, -\frac{\sin 65^\circ}{2} \right)$ $\vec{s} \approx \left(\boxed{-0,2}, \boxed{-0,5} \right)$



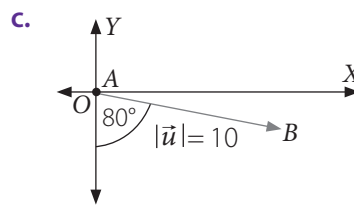
2. Calcula y señala las componentes de cada vector. Si es necesario, utiliza una calculadora y aproxima por redondeo a la décima.



$$u_x = 5 \cos 30^\circ \approx 4,3$$

$$u_y = 5 \sin 30^\circ = 2,5$$

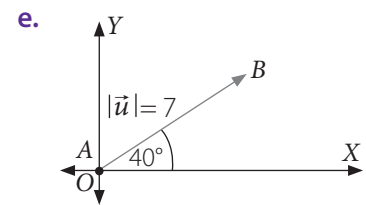
$$\vec{u} \approx (4,3; 2,5)$$



$$u_x = 10 \cos 340^\circ \approx 9,4$$

$$u_y = 10 \sin 340^\circ \approx -3,4$$

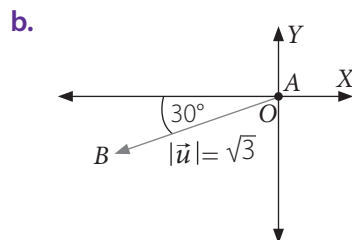
$$\vec{u} \approx (9,4; -3,4)$$



$$u_x = 7 \cos 40^\circ \approx 5,4$$

$$u_y = 7 \sin 40^\circ \approx 4,5$$

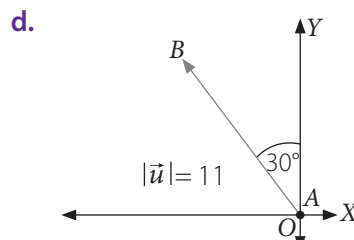
$$\vec{u} \approx (5,4; 4,5)$$



$$u_x = \sqrt{3} \cos 210^\circ \approx -1,5$$

$$u_y = \sqrt{3} \sin 210^\circ \approx -0,9$$

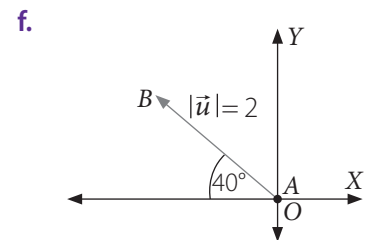
$$\vec{u} \approx (-1,5; -0,9)$$



$$u_x = 11 \cos 120^\circ = -5,5$$

$$u_y = 11 \sin 120^\circ \approx 9,5$$

$$\vec{u} \approx (-5,5; 9,5)$$



$$u_x = 2 \cos 140^\circ \approx -1,5$$

$$u_y = 2 \sin 140^\circ \approx 1,3$$

$$\vec{u} \approx (-1,5; 1,3)$$

3. Calcula en cada caso la magnitud del vector a partir de sus componentes.

a. $v_x = 4; v_y = 5$ $\|\vec{v}\| = \sqrt{41}$

$$\|\vec{v}\| = \sqrt{4^2 + 5^2} = \sqrt{16 + 25} = \sqrt{41}$$

e. $v_x = 2; v_y = 8$ $\|\vec{v}\| = 2\sqrt{17}$

$$\|\vec{v}\| = \sqrt{2^2 + 8^2} = \sqrt{4 + 64} = \sqrt{68}$$

b. $v_x = -3; v_y = 2$ $\|\vec{v}\| = \sqrt{13}$

$$\|\vec{v}\| = \sqrt{(-3)^2 + 2^2} = \sqrt{9 + 4} = \sqrt{13}$$

f. $v_x = 6; v_y = 7$ $\|\vec{v}\| = \sqrt{85}$

$$\|\vec{v}\| = \sqrt{6^2 + 7^2} = \sqrt{36 + 49} = \sqrt{85}$$

c. $v_x = 3; v_y = 6$ $\|\vec{v}\| = 3\sqrt{5}$

$$\|\vec{v}\| = \sqrt{3^2 + 6^2} = \sqrt{9 + 36} = \sqrt{45}$$

g. $v_x = -\frac{3}{5}; v_y = 4$ $\|\vec{v}\| = \frac{\sqrt{409}}{5}$

$$\|\vec{v}\| = \sqrt{\left(-\frac{3}{5}\right)^2 + 4^2} = \sqrt{\frac{9}{25} + 16} = \frac{\sqrt{409}}{5}$$

d. $v_x = -4; v_y = 25$ $\|\vec{v}\| = \sqrt{241}$

$$\|\vec{v}\| = \sqrt{(-4)^2 + 25^2} = \sqrt{16 + 225} = \sqrt{241}$$

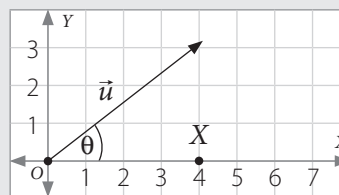
h. $v_x = -\frac{1}{4}; v_y = \frac{3}{5}$ $\|\vec{v}\| = \frac{13}{20}$

$$\|\vec{v}\| = \sqrt{\left(-\frac{1}{4}\right)^2 + \left(\frac{3}{5}\right)^2} = \sqrt{\frac{169}{400}} = \frac{13}{20}$$

4. Analiza la siguiente información. Luego, determina el ángulo que forma cada vector con el rayo OX.

El ángulo θ formado por el rayo OX y el vector $\vec{u} = (x, y)$ corresponde al valor de la función arcotangente, es decir:
 $\theta = \tan^{-1}\left(\frac{y}{x}\right)$. En la calculadora es la tecla \tan^{-1} y para calcular el ángulo θ , usas las teclas:

$$\text{SHIFT} \quad \text{tan}^{-1} \left(\frac{\text{valor } y}{\text{valor } x} \right) =$$



a. $\vec{v} = (1, 6)$

$$\theta = 80^\circ 32' 16''$$

d. $\vec{v} = (7, -4)$

$$\theta = 330^\circ 15' 18''$$

g. $\vec{v} = (-3, 2)$

$$\theta = 146^\circ 18' 36''$$

b. $\vec{v} = (-2, 9)$

$$\theta = 102^\circ 31' 44''$$

e. $\vec{v} = (3, 6)$

$$\theta = 63^\circ 26' 6''$$

h. $\vec{v} = (-4, -4)$

$$\theta = 225^\circ$$

c. $\vec{v} = (-3, -1)$

$$\theta = 198^\circ 26' 6''$$

f. $\vec{v} = (-1, 1)$

$$\theta = 135^\circ$$

i. $\vec{v} = (2, -3)$

$$\theta = 123^\circ 41'$$