

Descomposición vectorial

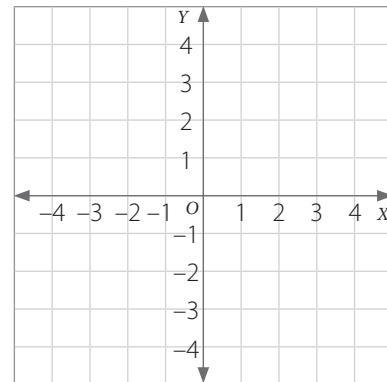
1. Calcula las componentes y representa en el plano cartesiano los siguientes vectores. Si es necesario, utiliza una calculadora y aproxima por redondeo a la décima.

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

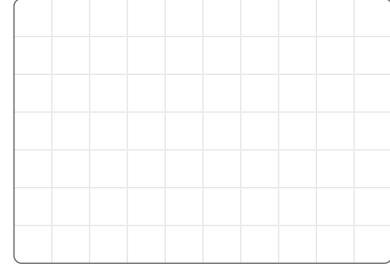
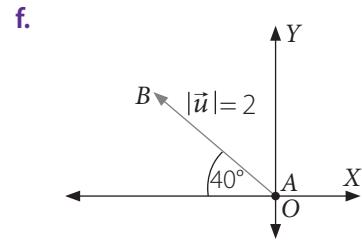
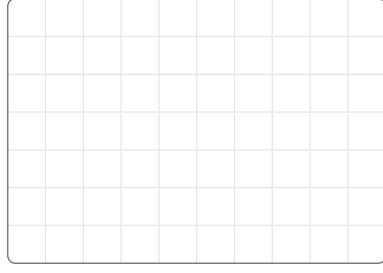
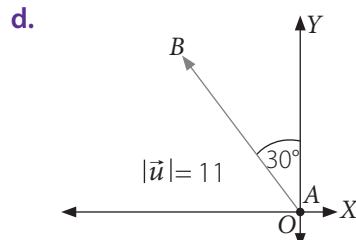
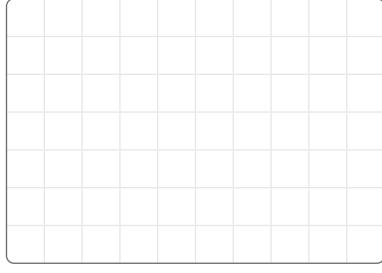
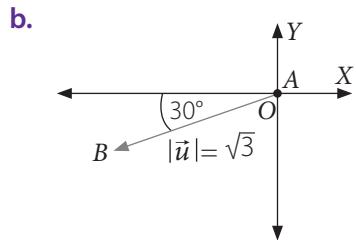
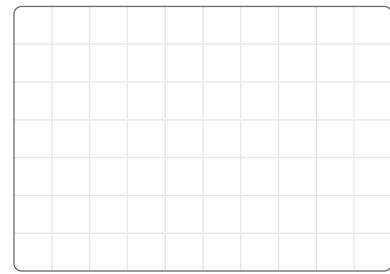
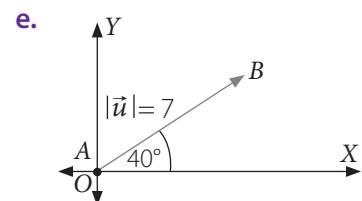
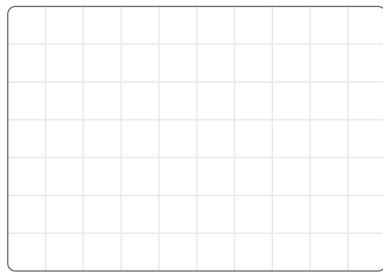
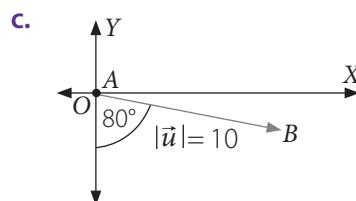
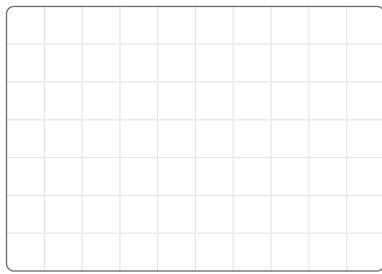
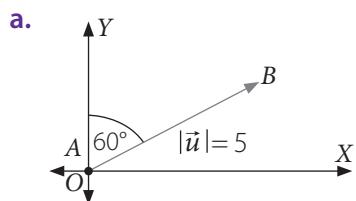
b. $\vec{v} = (-4\cos 45^\circ, 4\sin 45^\circ)$ $\vec{v} \approx (\quad , \quad)$

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

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

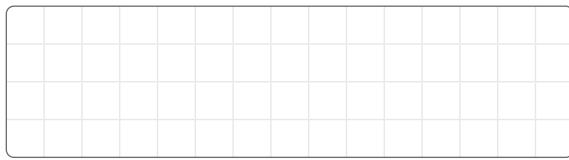


2. Calcula y señala las componentes de cada vector. Si es necesario, utiliza una calculadora y aproxima por redondeo a la décima.

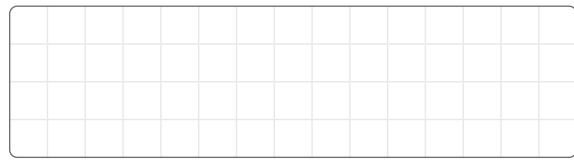


3. Calcula en cada caso la magnitud del vector a partir de sus componentes.

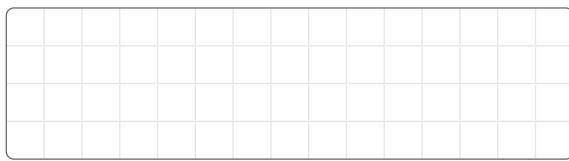
a. $v_x = 4; v_y = 5 \quad \|\vec{v}\| =$



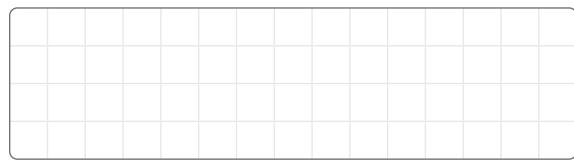
e. $v_x = 2; v_y = 8 \quad \|\vec{v}\| =$



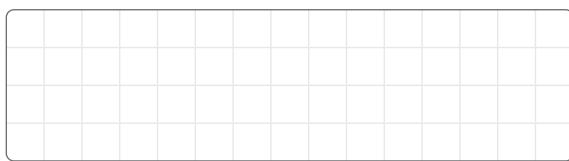
b. $v_x = -3; v_y = 2 \quad \|\vec{v}\| =$



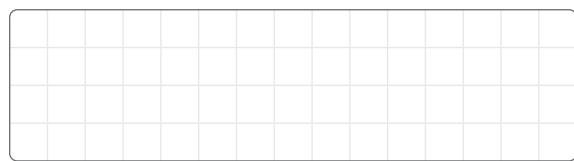
f. $v_x = 6; v_y = 7 \quad \|\vec{v}\| =$



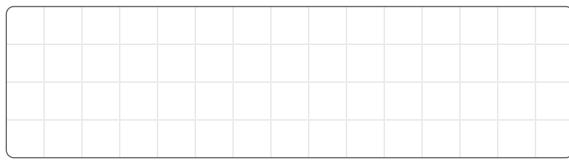
c. $v_x = 3; v_y = 6 \quad \|\vec{v}\| =$



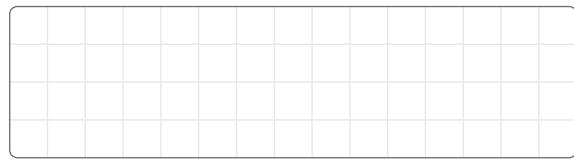
g. $v_x = -\frac{3}{5}; v_y = 4 \quad \|\vec{v}\| =$



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



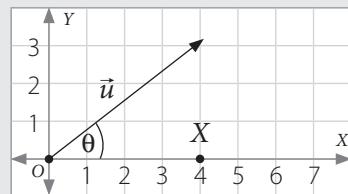
h. $v_x = -\frac{1}{4}; v_y = \frac{3}{5} \quad \|\vec{v}\| =$



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:

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



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

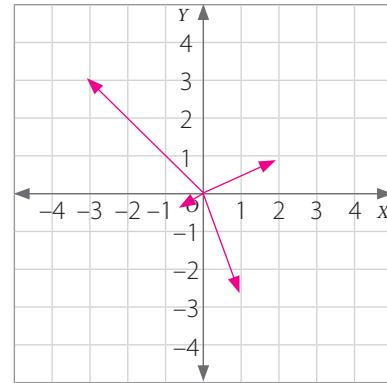
1. Calcula las componentes y representa en el plano cartesiano los siguientes vectores. Si es necesario, utiliza una calculadora y aproxima por redondeo a la décima.

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

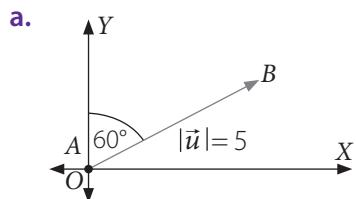
b. $\vec{v} = (-4\cos 45^\circ, 4\sin 45^\circ)$ $\vec{v} \approx \left(\boxed{-2,8}, \boxed{2,8} \right)$

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

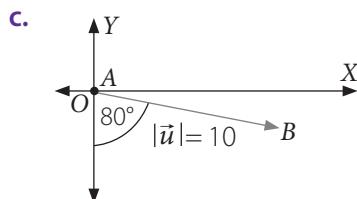
d. $\vec{s} = \left(-\frac{\cos 65^\circ}{2}, -\frac{\sin 65^\circ}{2} \right)$ $\vec{s} \approx \left(\boxed{-0,2}, \boxed{-0,5} \right)$



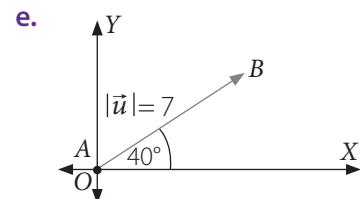
2. Calcula y señala las componentes de cada vector. Si es necesario, utiliza una calculadora y aproxima por redondeo a la décima.



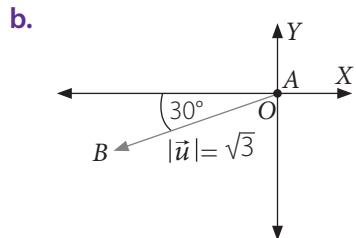
$$\begin{aligned} u_x &= 5 \cos 30^\circ \approx 4,3 \\ u_y &= 5 \sin 30^\circ = 2,5 \\ \vec{u} &\approx (4,3; 2,5) \end{aligned}$$



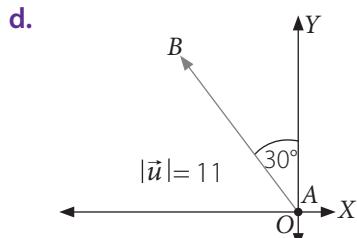
$$\begin{aligned} u_x &= 10 \cos 340^\circ \approx 9,4 \\ u_y &= 10 \sin 340^\circ \approx -3,4 \\ \vec{u} &\approx (9,4; -3,4) \end{aligned}$$



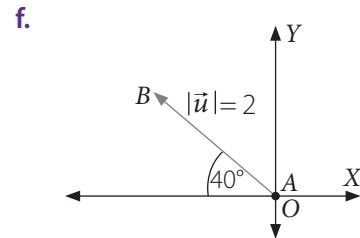
$$\begin{aligned} u_x &= 7 \cos 40^\circ \approx 5,4 \\ u_y &= 7 \sin 40^\circ \approx 4,5 \\ \vec{u} &\approx (5,4; 4,5) \end{aligned}$$



$$\begin{aligned} u_x &= \sqrt{3} \cos 210^\circ \approx -1,5 \\ u_y &= \sqrt{3} \sin 210^\circ \approx -0,9 \\ \vec{u} &\approx (-1,5; -0,9) \end{aligned}$$



$$\begin{aligned} u_x &= 11 \cos 120^\circ = -5,5 \\ u_y &= 11 \sin 120^\circ \approx 9,5 \\ \vec{u} &\approx (-5,5; 9,5) \end{aligned}$$



$$\begin{aligned} u_x &= 2 \cos 140^\circ \approx -1,5 \\ u_y &= 2 \sin 140^\circ \approx 1,3 \\ \vec{u} &\approx (-1,5; 1,3) \end{aligned}$$

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

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

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

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

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

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

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

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

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

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

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

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

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

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

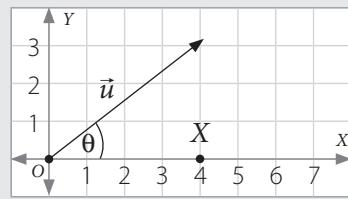
$$\|\vec{v}\| = \sqrt{(-4)^2 + 25^2} = \sqrt{16 + 225} = \sqrt{241}$$

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

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

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:



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

$\theta = \boxed{80^\circ 32' 16''}$

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

$\theta = \boxed{330^\circ 15' 18''}$

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

$\theta = \boxed{146^\circ 18' 36''}$

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

$\theta = \boxed{102^\circ 31' 44''}$

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

$\theta = \boxed{63^\circ 26' 6''}$

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

$\theta = \boxed{225^\circ}$

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

$\theta = \boxed{198^\circ 26' 6''}$

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

$\theta = \boxed{135^\circ}$

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

$\theta = \boxed{123^\circ 41'}$