Descomposición vectorial

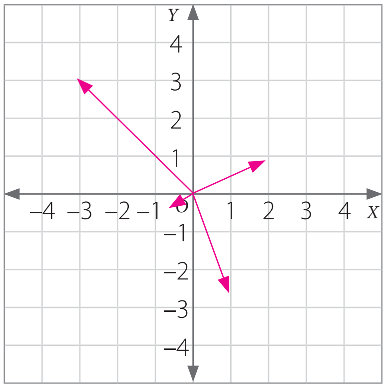
1. Calcula las componentes y representa en el plano cartesiano los vectores que se describen. Si es necesario, utiliza una calculadora y redondea los resultados a la cifra de las décimas.

a. $\vec{u} = (3\cos 70°, -3\text{sen } 70°)$ $\qquad \vec{u} \approx (1, -2{,}8)$

b. $\vec{v} = (-4\cos 45°, 4\text{sen } 45°)$ $\qquad \vec{v} \approx (-2{,}8, 2{,}8)$

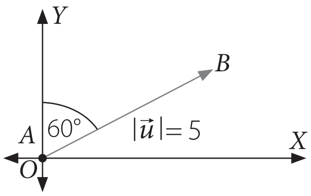
c. $\vec{w} = (2\cos 15°, 2\text{sen } 15°)$ $\qquad \vec{w} \approx (1{,}9, 0{,}5)$

d. $\vec{s} = \left(-\dfrac{\cos 65°}{2}, -\dfrac{\text{sen } 65°}{2}\right)$ $\qquad \vec{s} \approx (-0{,}2, -0{,}5)$



2. Calcula y señala las componentes de cada vector. Si es necesario, utiliza una calculadora y redondea los resultados a la cifra de las décimas.

a.

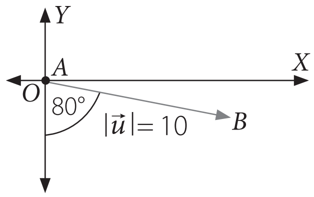


$u_x = 5 \cos 30° \approx 4{,}3$

$u_y = 5 \text{ sen } 30° = 2{,}5$

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

c.

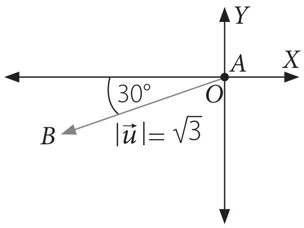


$u_x = 10 \cos 340° \approx 9{,}4$

$u_y = 10 \text{ sen } 340° \approx -3{,}4$

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

b.

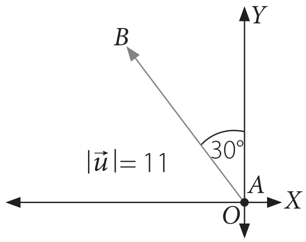


$u_x = \sqrt{3} \cos 210° \approx -1{,}5$

$u_y = \sqrt{3} \text{ sen } 210° \approx -0{,}9$

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

d.



$u_x = 11 \cos 120° = -5{,}5$

$u_y = 11 \text{ sen } 120° \approx 9{,}5$

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

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

a. $v_x = 4; v_y = 5$

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

$\|\vec{v}\| =$ $\sqrt{41}$

b. $v_x = -3; v_y = 2$

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

$\|\vec{v}\| =$ $\sqrt{13}$

c. $v_x = 3\,; v_y = 6$

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

$\|\vec{v}\| =$ $3\sqrt{5}$

d. $v_x = -4; v_y = 25$

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

$\|\vec{v}\| =$ $\sqrt{241}$

e. $v_x = 2; v_y = 8$

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

$\|\vec{v}\| =$ $2\sqrt{17}$

f. $v_x = 6; v_y = 7$

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

$\|\vec{v}\| =$ $\sqrt{85}$

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

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

$\|\vec{v}\| =$ $\frac{\sqrt{409}}{5}$

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

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

$\|\vec{v}\| =$ $\frac{13}{20}$