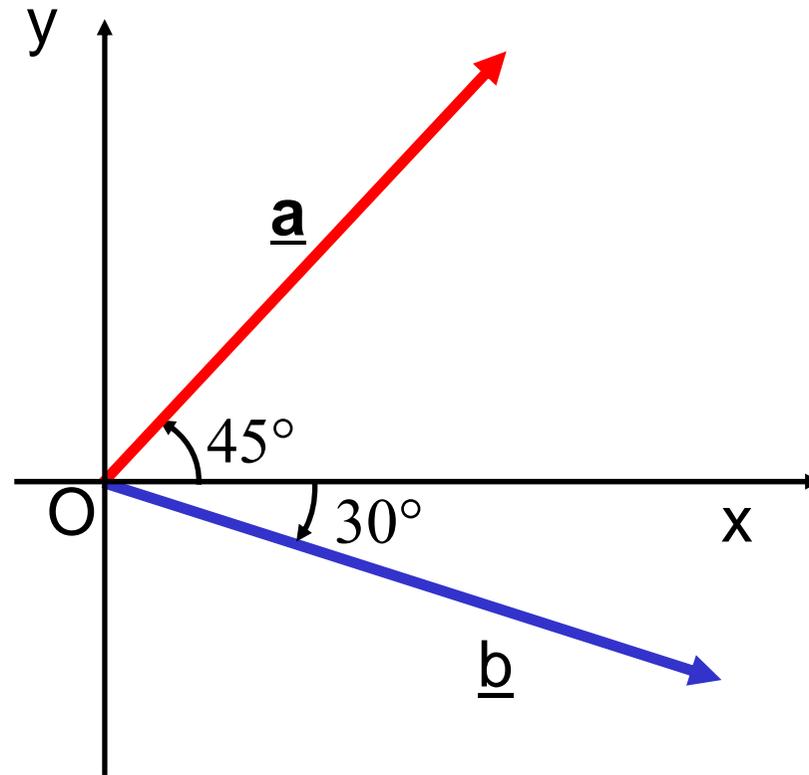


ESERCIZI DI CALCOLO VETTORIALE

ESERCIZIO 1

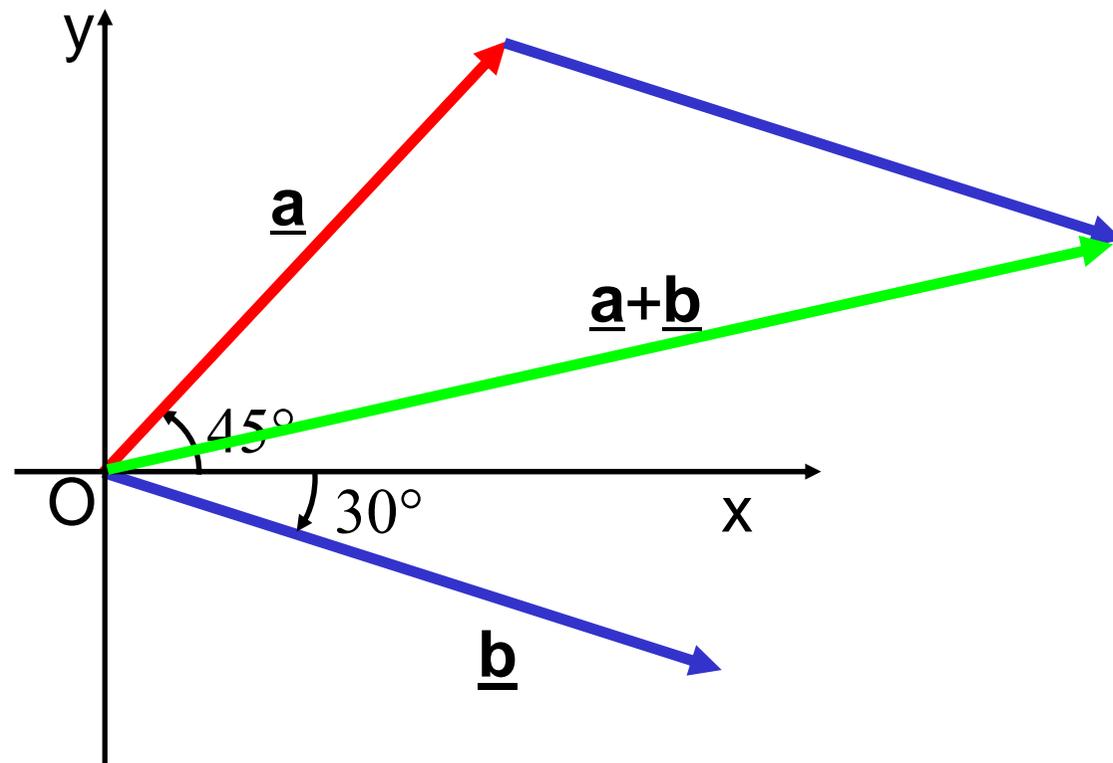
I vettori spostamento \underline{a} e \underline{b} mostrati nella figura hanno lo stesso modulo pari a 2m . Si trovino graficamente i vettori $\underline{a+b}$, $\underline{a-b}$ e $\underline{b-a}$.



ESERCIZIO 1

Vettore somma $\underline{a+b}$

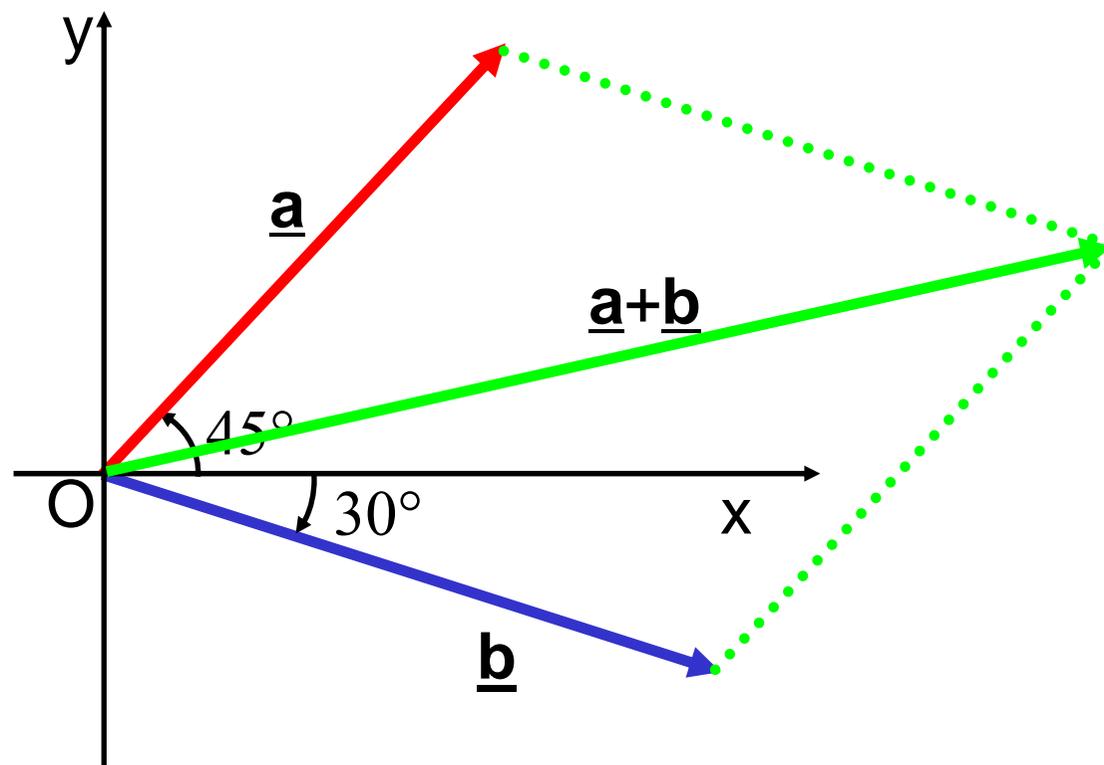
METODO PUNTA CODA



ESERCIZIO 1

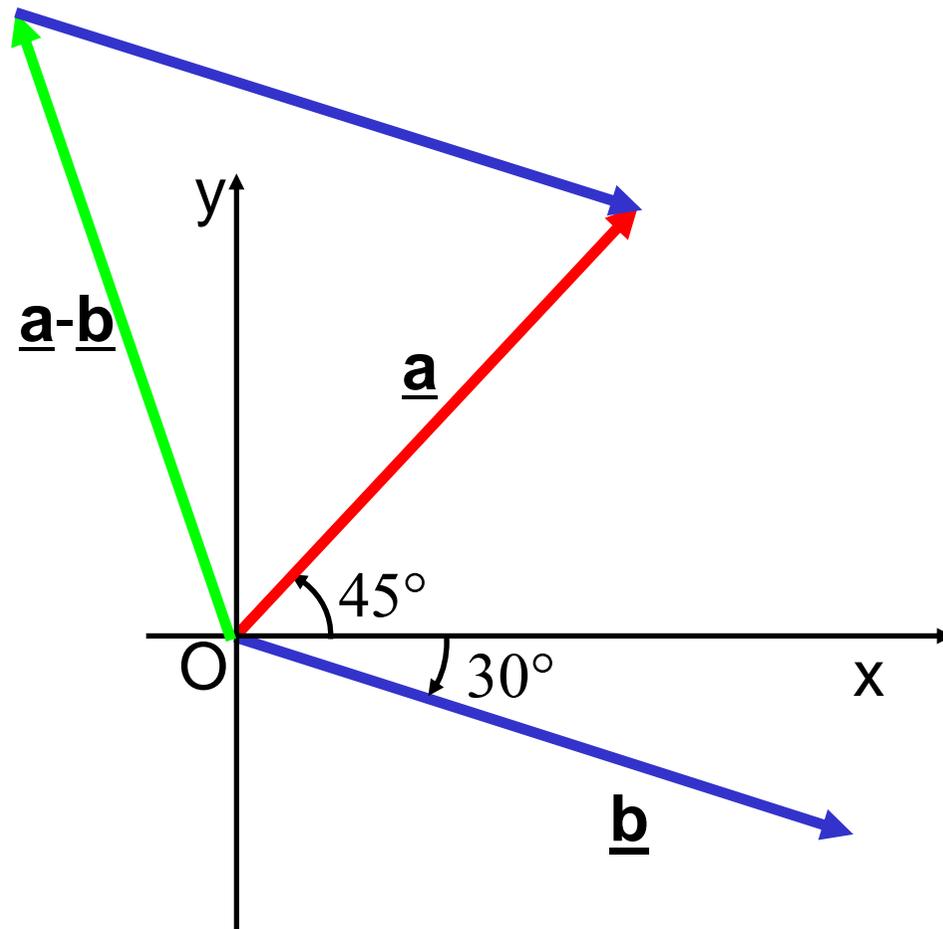
Vettore somma $\underline{a+b}$

METODO DEL PARALLELOGRAMMA



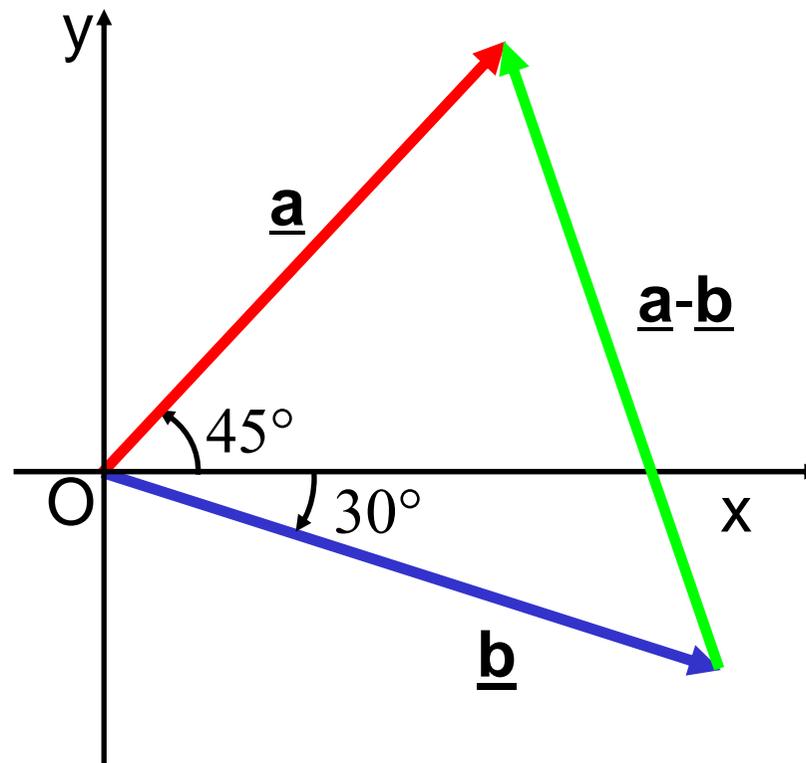
ESERCIZIO 1

Vettore differenza $\underline{a-b}$



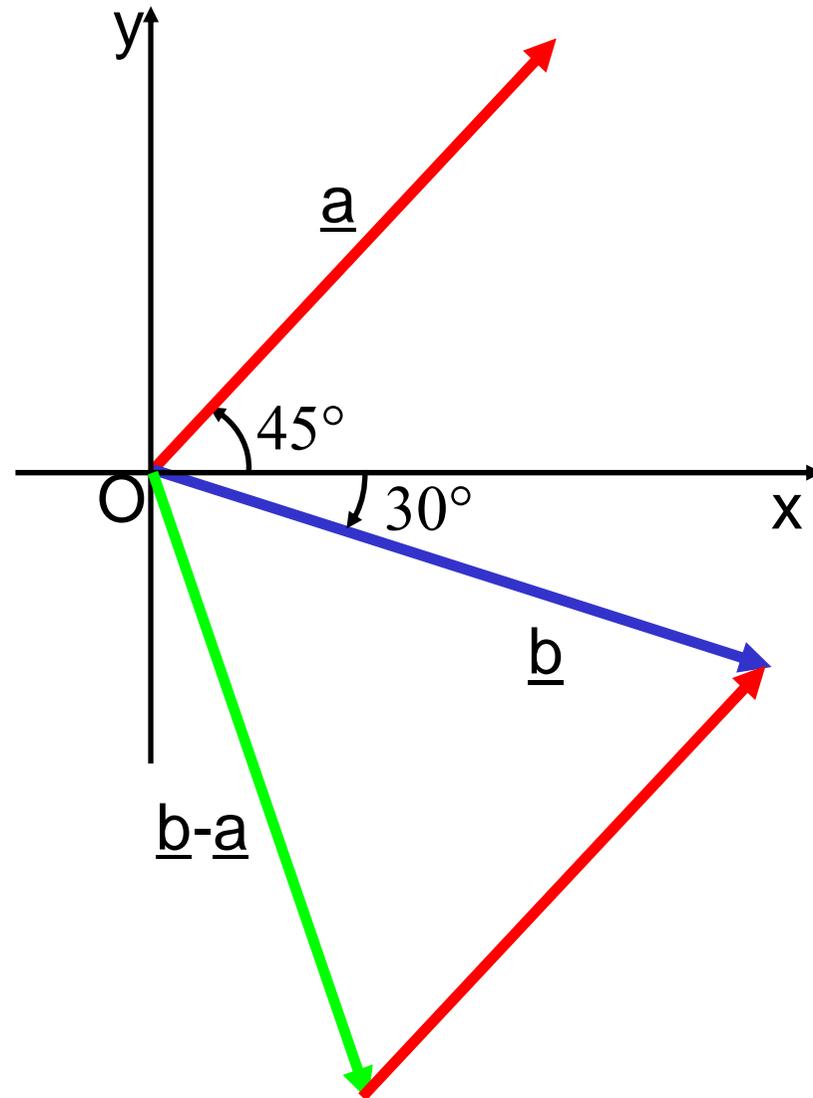
ESERCIZIO 1

Vettore differenza $a-b$



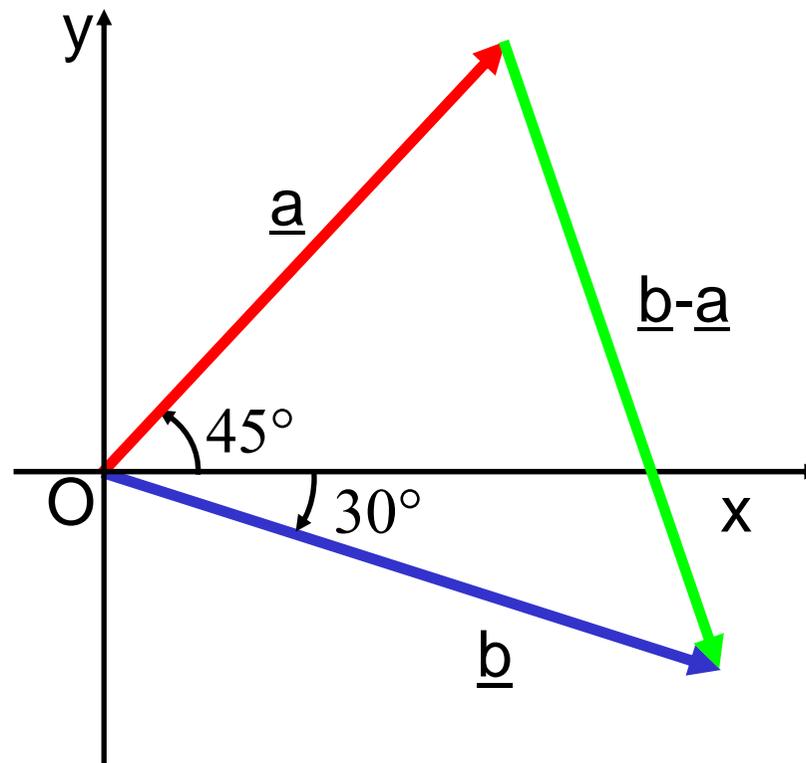
ESERCIZIO 1

Vettore differenza $\underline{b-a}$



ESERCIZIO 1

Vettore differenza $\underline{b-a}$



ESERCIZIO 2

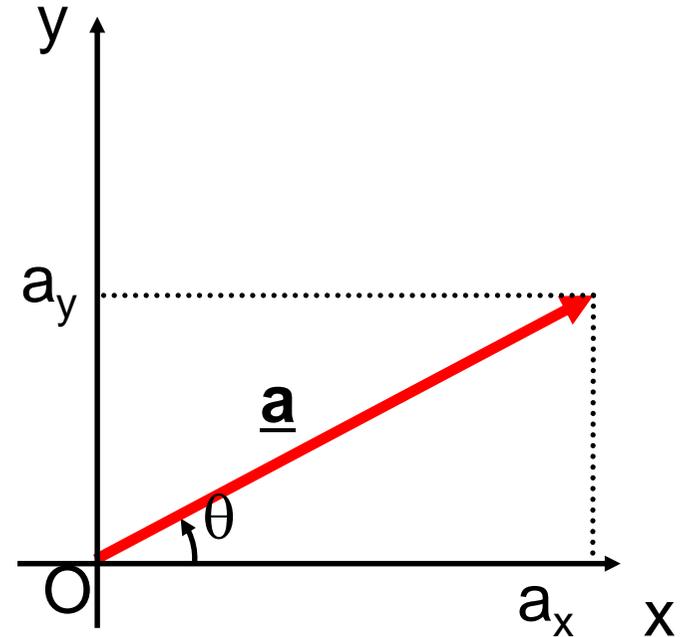
Si trovino le componenti x ed y del vettore che giace sul piano xy, ha modulo a e forma un angolo θ con l'asse x.

$$a = 10 \text{ m}$$

$$\theta = 30^\circ$$

$$a_x = 10 \cos(30^\circ) = 8,66 \text{ m}$$

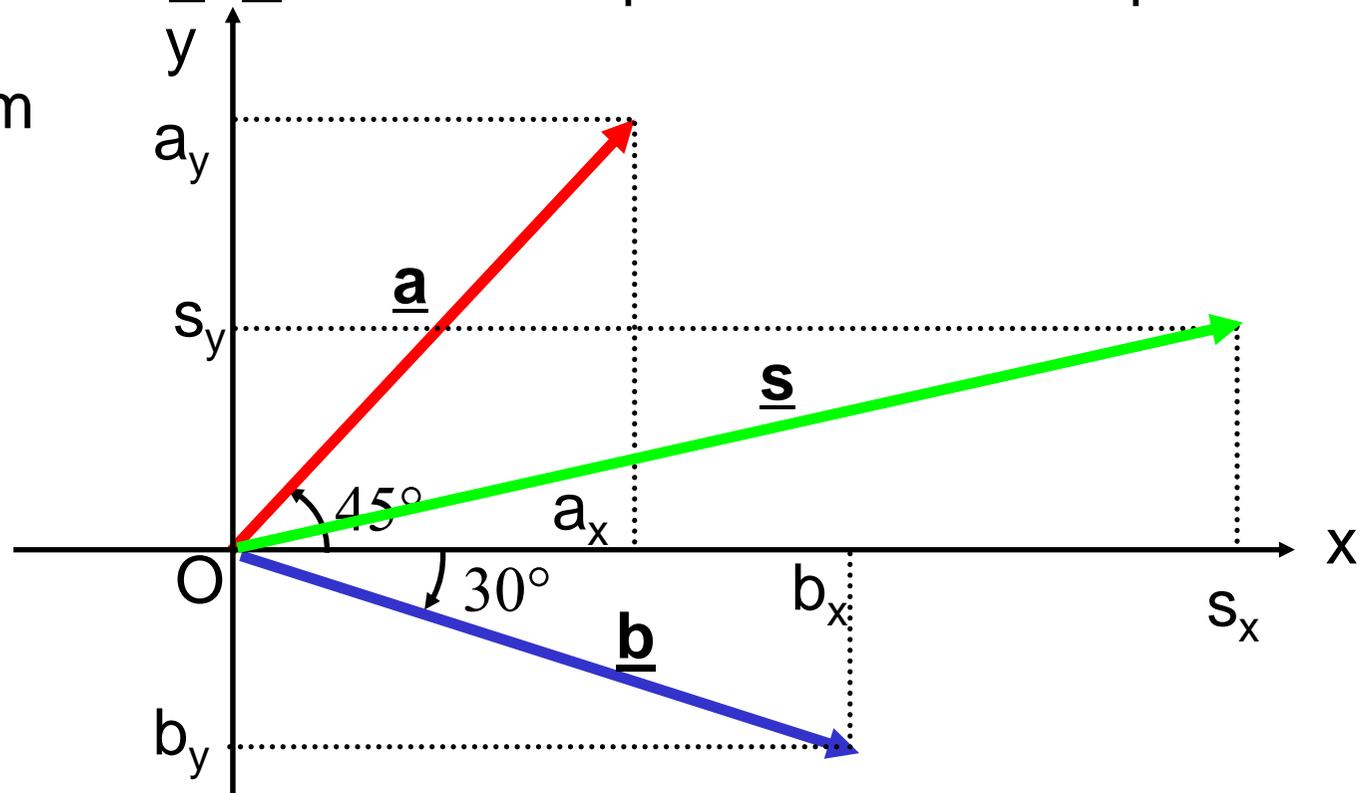
$$a_y = 10 \sin(30^\circ) = 5 \text{ m}$$



ESERCIZIO 3

Si trovino le componenti a_x , a_y e b_x , b_y dei vettori \underline{a} e \underline{b} rispetto al sistema di riferimento in figura. Si trovi inoltre il vettore somma $\underline{a} + \underline{b}$ calcolato a partire da tali componenti.

$$a = b = 2\text{m}$$



$$s_x = a_x + b_x = a \cos(45^\circ) + b \cos(-30^\circ) = 2 \sqrt{2}/2 + 2 \sqrt{3}/2 = 3,14$$

$$s_y = a_y + b_y = a \sin(45^\circ) + b \sin(-30^\circ) = 2 \sqrt{2}/2 + 2 (-1/2) = 0,41$$

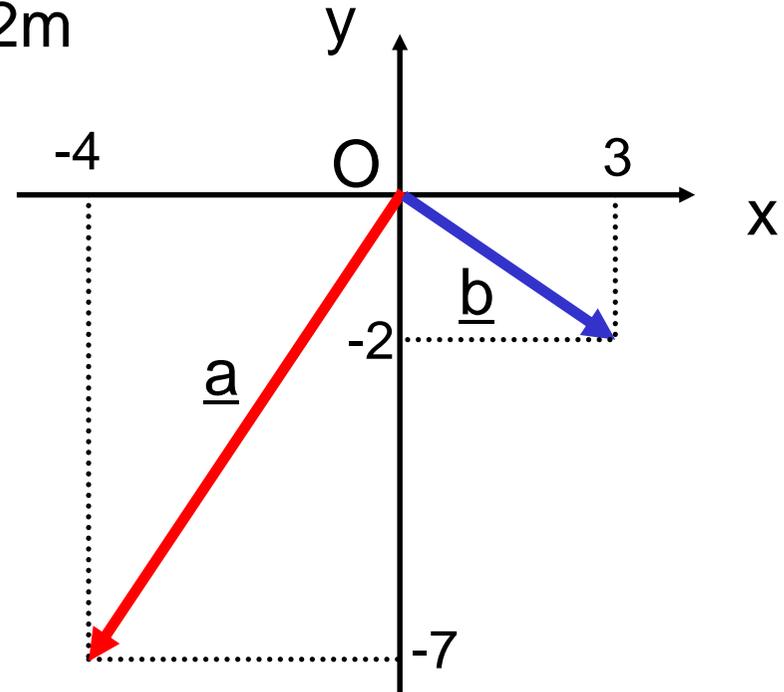
ESERCIZIO 4

Si trovino modulo, direzione e verso di $\underline{\mathbf{a}}$, $\underline{\mathbf{b}}$, e $\underline{\mathbf{a}}+\underline{\mathbf{b}}$ per i vettori $\underline{\mathbf{a}}$ e $\underline{\mathbf{b}}$ che hanno le seguenti componenti:

$$a_x = -4\text{m}, a_y = -7\text{m}, b_x = 3\text{m}, b_y = -2\text{m}$$

$$a = \sqrt{(-4)^2 + (-7)^2} = 8,06 \text{ m}$$

$$b = \sqrt{(3)^2 + (-2)^2} = 3,87 \text{ m}$$



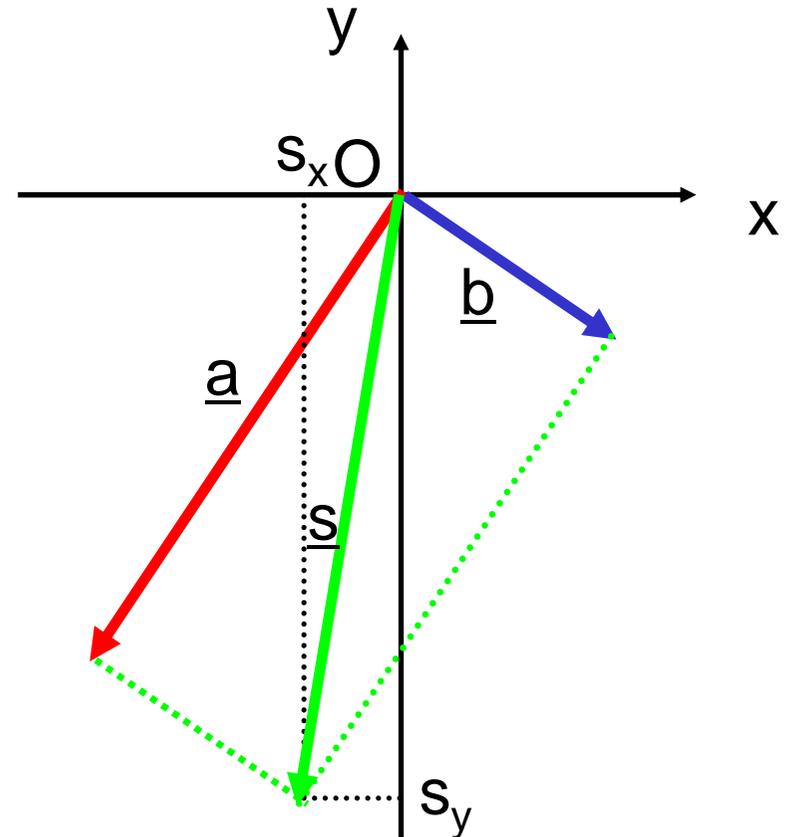
ESERCIZIO 4

Il vettore somma $\underline{s} = \underline{a} + \underline{b}$ è dato da:

$$s_x = (\underline{a} + \underline{b})_x = a_x + b_x = (-4) + (3) = -1 \text{ m}$$

$$s_y = (\underline{a} + \underline{b})_y = a_y + b_y = (-7) + (-2) = -9 \text{ m}$$

$$s = |\underline{a} + \underline{b}| = \sqrt{s_x^2 + s_y^2} = \sqrt{(-1)^2 + (-9)^2} = 9,05 \text{ m}$$



ESERCIZIO 5

Si trovino modulo e direzione orientata di $\underline{\mathbf{a}}$, $\underline{\mathbf{b}}$, e $\underline{\mathbf{a+b}}$ per i vettori $\underline{\mathbf{a}}$ e $\underline{\mathbf{b}}$ che hanno le seguenti componenti:

$$a_x = 1\text{m}, a_y = -4\text{m}, b_x = 2\text{m}, b_y = 6\text{m}$$

$$a = \sqrt{(1)^2 + (-4)^2} = 4,12 \text{ m}$$

$$b = \sqrt{(2)^2 + (6)^2} = 6,32 \text{ m}$$

$$s_x = (\underline{\mathbf{a+b}})_x = 1 + 2 = 3 \text{ m}$$

$$s_y = (\underline{\mathbf{a+b}})_y = (-4) + 6 = 2 \text{ m}$$

$$s = |\underline{\mathbf{a+b}}| = \sqrt{3^2 + 2^2} = 3,60 \text{ m}$$

