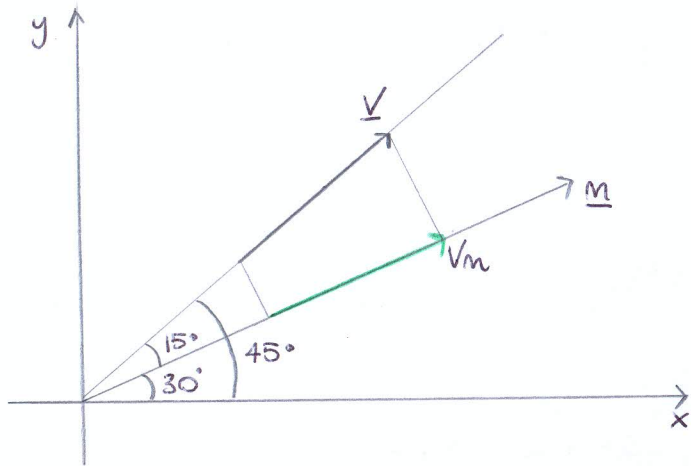


## COMPONENTE DI UN VETTORE SULLA RETTA ORIENTATA

Dato il vettore e la retta orientata determina la proiezione ortogonale del vettore sulla retta.

①



$$V = (2,5; 2,5)$$

$$M = (\cos 30^\circ; \cos 60^\circ)$$

↓                      ↓  
 $\frac{\sqrt{3}}{2}$                        $\frac{1}{2}$

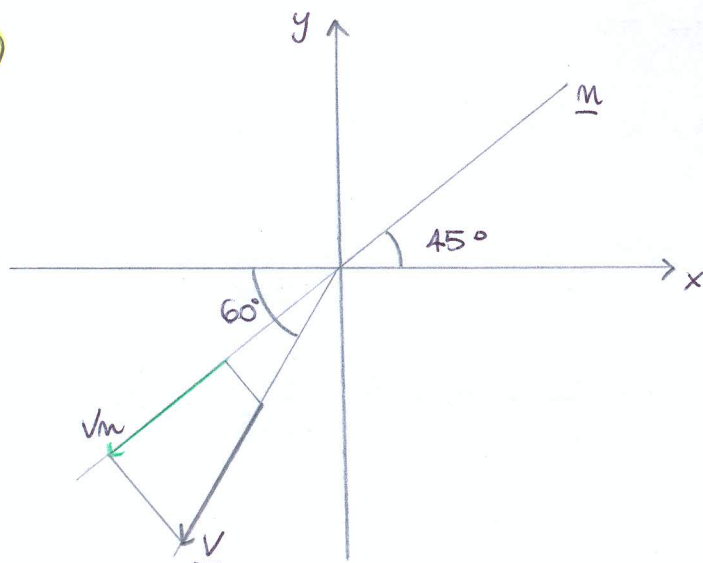
### PROCEDIMENTO 1

$$V_m = V \cos 15^\circ = (\sqrt{2,5^2 + 2,5^2}) \cdot \cos 15^\circ = 3,415$$

### PROCEDIMENTO 2 (prodotto scalare)

$$\underline{V} \cdot \underline{M} = V_x \cdot M_x + V_y \cdot M_y = 2,5 \cdot \frac{\sqrt{3}}{2} + 2,5 \cdot \frac{1}{2} = 3,415$$

②



$$V = (-4 \cos 60^\circ; -4 \cos 30^\circ)$$

↓                      ↓  
 $\frac{1}{2}$                        $\frac{\sqrt{3}}{2}$

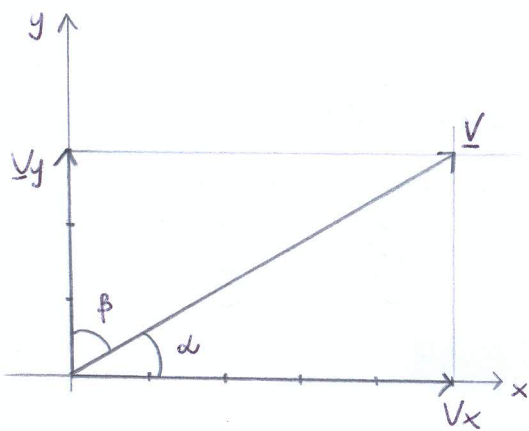
$$M = (\cos 45^\circ; \cos 45^\circ)$$

↓                      ↓  
 $\frac{\sqrt{2}}{2}$                        $\frac{\sqrt{2}}{2}$

$$V_m = \underline{V} \cdot \underline{M} = V_x \cdot M_x + V_y \cdot M_y = \left(-2 \cdot \frac{\sqrt{2}}{2}\right) + \left(-\frac{2}{\sqrt{3}} \cdot \frac{\sqrt{2}}{2}\right) = -2,2307$$

Ricavare gli angoli  $\alpha$  e  $\beta$  dato il vettore  $\underline{V}$ .

①



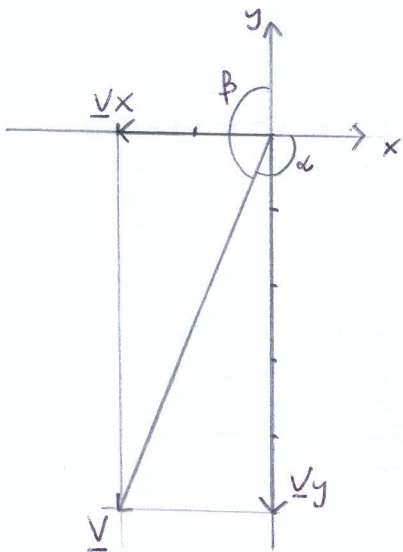
$$\underline{V} = (5, 3)$$

$$V = |\underline{V}| = \sqrt{V_x^2 + V_y^2} = \sqrt{25 + 9} = \sqrt{34} = 5,83$$

$$\cos \alpha = \frac{V_x}{V} = \frac{5}{5,83} = 0,8576 \rightarrow \alpha = \arccos 0,8576 = 30,95^\circ$$

$$\cos \beta = \frac{V_y}{V} = \frac{3}{5,83} = 0,5145 \rightarrow \beta = \arccos 0,5145 = 59,05^\circ$$

②



$$\underline{V} = (-2, -5)$$

$$V = |\underline{V}| = \sqrt{V_x^2 + V_y^2} = \sqrt{4 + 25} = \sqrt{29} = 5,38$$

$$\alpha = \arccos \frac{V_x}{V} = \arccos \frac{-2}{5,38} = 111^\circ$$

$$\beta = \arccos \frac{V_y}{V} = \arccos \frac{-5}{5,38} = 158,3^\circ$$

Dati due vettori, ricava la risultante.

$$\underline{U} = (-2; 3; 4)$$

$$\underline{V} = (-5; 2; 3)$$

$$\underline{R} = \underline{U} + \underline{V} = (-7, 1, 7) = -7\underline{i} + 1\underline{j} + 7\underline{k}$$

$$|\underline{R}| = \sqrt{(-7)^2 + (1)^2 + (7)^2} = 9,9498$$

Dati due vettori e la risultante determina gli angoli che la risultante forma con gli assi coordinati.

$$\underline{U} = (-3; 2)$$

$$\underline{V} = (1; -3)$$

$$\underline{R} = (-2; -1)$$

$$|\underline{R}| = \sqrt{R_x^2 + R_y^2} = \sqrt{4 + 1} = \sqrt{5}$$

$$R_x = |\underline{R}| \cos \alpha \rightarrow \cos \alpha = \frac{R_x}{|\underline{R}|} = \frac{-2}{\sqrt{5}} \rightarrow \alpha = \arccos\left(-\frac{2}{\sqrt{5}}\right) = 153,4^\circ$$

$$R_y = |\underline{R}| \cos \beta \rightarrow \cos \beta = \frac{R_y}{|\underline{R}|} = \frac{-1}{\sqrt{5}} \rightarrow \beta = \arccos\left(-\frac{1}{\sqrt{5}}\right) = 116,5^\circ$$

