

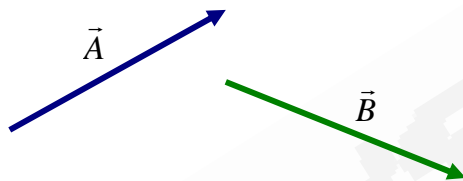
Lembre-se:

Ângulo (θ)	cós θ	Ângulo (θ)	cós θ
0°		120°	
30°		135°	
45°		150°	
60°		180°	
90°		270°	

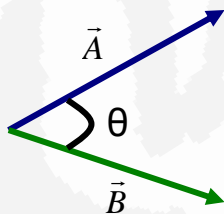
Ângulo entre vetores

É o ângulo formado quando se une a base do sentido (parte sem seta) de dois vetores.

Ex.: Sejam os dois vetores abaixo, \vec{A} e \vec{B} .

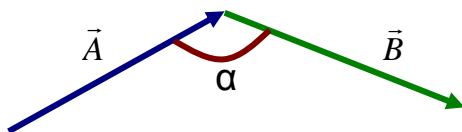


O ângulo entre esses dois vetores será θ (lê-se "teta"):



Ângulo complementar

Ao unir o sentido do vetor \vec{A} com a base do sentido do vetor \vec{B} , obtemos o chamado Ângulo complementar a θ , que será representado por α (lê-se alfa).



Lei dos co-senos

A direção e o sentido do vetor soma (\vec{S}) são dados pela regra da linha poligonal (aula 2).

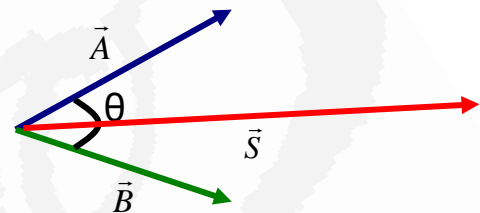
Pode-se encontrar o módulo do vetor Soma, quando os vetores \vec{A} e \vec{B} fizerem um ângulo qualquer através da lei dos co-senos.

Para tal precisamos determinar ou o ângulo entre os vetores (θ) ou o seu complementar (α).

a) Lei dos co-senos a partir do ângulo entre os vetores (θ): O módulo do vetor soma (\vec{S}) será dado por.

$$S^2 = A^2 + B^2 + 2AB \cos \theta$$

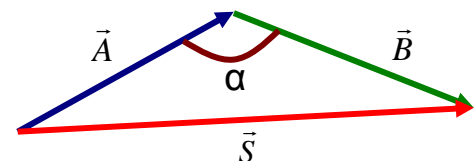
Sendo:



b) Lei dos co-senos a partir do ângulo complementar (α): O módulo do vetor soma (\vec{S}) será dado por.

$$S^2 = A^2 + B^2 - 2AB \cos \alpha$$

Sendo:



Obs.: Note que:

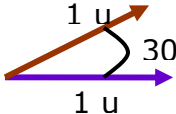
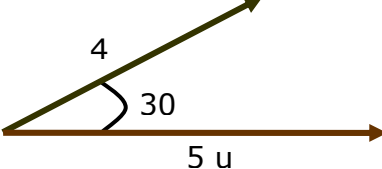
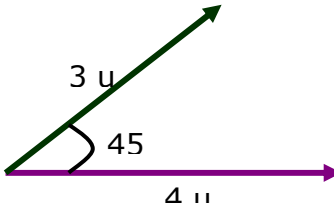
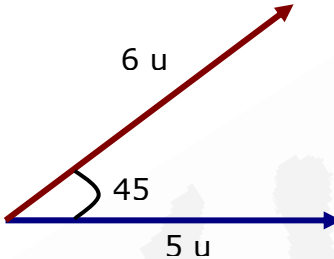
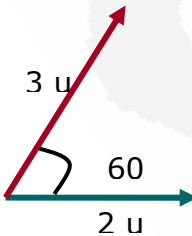
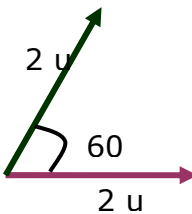
a) Quando $\theta = 0^\circ$, $S^2 = A^2 + B^2 + 2AB \cos \theta$, torna-se: $S = A + B$ (soma de dois vetores no mesmo sentido).

b) Quando $\theta = 180^\circ$, $S^2 = A^2 + B^2 + 2AB \cos \theta$, torna-se: $S = A - B$ (soma de dois vetores em sentidos opostos).

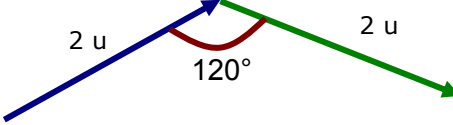
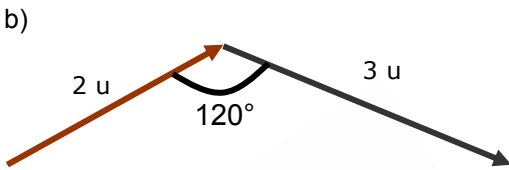
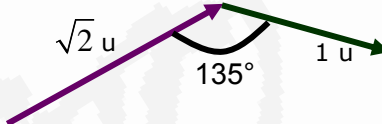

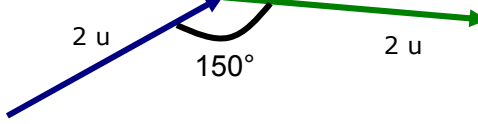
c) Quando $\theta = 90^\circ$, $S^2 = A^2 + B^2 + 2AB \cos \theta$, torna-se: $S^2 = A^2 + B^2$ (soma de dois vetores perpendiculares).

EXERCÍCIOS

01. Determine o módulo do vetor soma nos casos a seguir:

- a) 
- b) 
- c) 
- d) 
- e) 
- f) 

02. Determine o módulo do vetor soma nos casos a seguir:

- a) 
- b) 
- c) 
- d) 
- e) 
- f) 