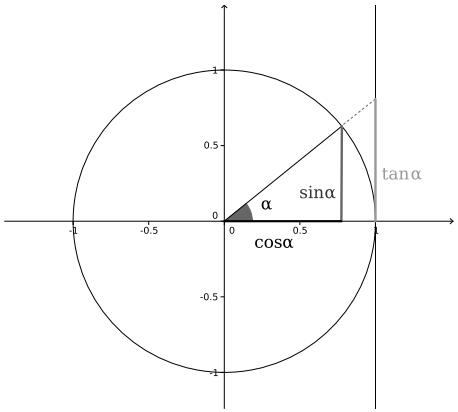
TRIGONOMETRIA E VETTORI



Relazioni fondamentali

$\cos^2\alpha + \sin^2\alpha = 1$

(Teorema di Pitagora)

$\tan\alpha = \frac{\sin\alpha}{\cos\alpha}$

(Definizione di tangente)

Proprietà

$\sin(\pi - \alpha) = \sin(\alpha)$

$\cos(\pi - \alpha) = -\cos(\alpha)$

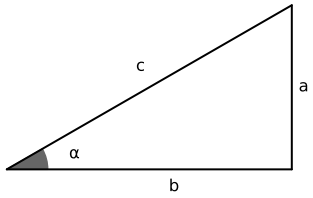
$\sin(\pi + \alpha) = -\sin(\alpha)$

$\cos(\pi + \alpha) = -\cos(\alpha)$

$\sin(\frac{\pi}{2} - \alpha) = \cos(\alpha)$

$\cos(\frac{\pi}{2} - \alpha) = \sin(\alpha)$

Triangolo rettangolo



$a = c \cdot \sin\alpha \;||\; b = c \cdot \cos\alpha \;||\; a = b \cdot \tan\alpha$

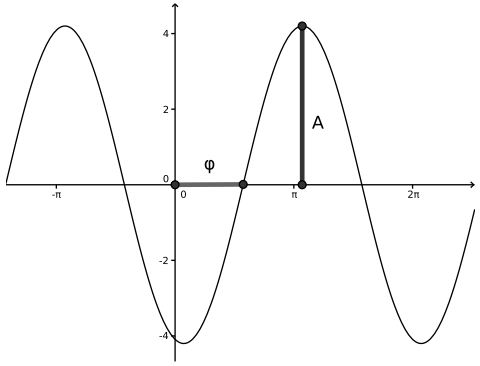
Formule di addizione e sottrazione

$\sin(\alpha + \beta) = \sin\alpha\cos\beta + \cos\alpha\sin\beta$

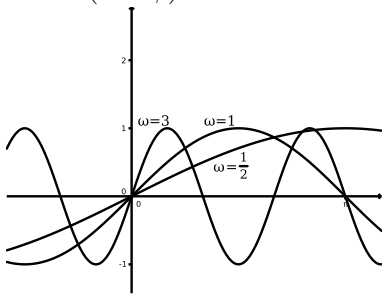
$\cos(\alpha + \beta) = \cos\alpha\cos\beta - \sin\alpha\sin\beta$

$\sin(\alpha - \beta) = \sin\alpha\cos\beta - \cos\alpha\sin\beta$

$\cos(\alpha - \beta) = \cos\alpha\cos\beta + \sin\alpha\sin\beta$



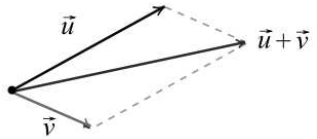
$f(x) = A\sin(x - \phi)$



$f(x) = \sin(\omega x)$

Somma di due vettori

$\overrightarrow{v} + \overrightarrow{u} = \begin{pmatrix} v_x \\ v_y \end{pmatrix} + \begin{pmatrix} u_x \\ u_y \end{pmatrix} = \begin{pmatrix} v_x + u_x \\ v_y + u_y \end{pmatrix}$



Moltiplicazione per uno scalare $\lambda \in \mathbb{R}$

$\lambda\overrightarrow{v} = \lambda \begin{pmatrix} v_x \\ v_y \end{pmatrix} = \begin{pmatrix} \lambda v_x \\ \lambda v_y \end{pmatrix}$

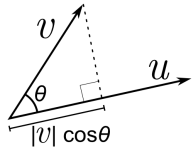
Lunghezza o norma di un vettore

$|\overrightarrow{v}| = |\begin{pmatrix} v_x \\ v_y \\ v_z \end{pmatrix}| = \sqrt{v_x^2 + v_y^2 + v_z^2}$

Prodotto scalare tra due vettori

$\overrightarrow{v} \cdot \overrightarrow{u} = \begin{pmatrix} v_x \\ v_y \\ v_z \end{pmatrix} \cdot \begin{pmatrix} u_x \\ u_y \\ u_z \end{pmatrix} = |u||v|\cos\theta =$

$v_x u_x + v_y u_y + v_z u_z$



Prodotto vettoriale tra due vettori

$\overrightarrow{v} \times \overrightarrow{u} = \begin{pmatrix} v_x \\ v_y \\ v_z \end{pmatrix} \times \begin{pmatrix} u_x \\ u_y \\ u_z \end{pmatrix} =$

$\det \begin{pmatrix} \overrightarrow{i} & \overrightarrow{j} & \overrightarrow{k} \\ v_x & v_y & v_z \\ u_x & u_y & u_z \end{pmatrix} =$

$\begin{pmatrix} v_y u_z - v_z u_y \\ -(v_x u_z - v_z u_x) \\ v_x u_y - v_y u_x \end{pmatrix} = \overrightarrow{n}|u||v|\sin\theta$