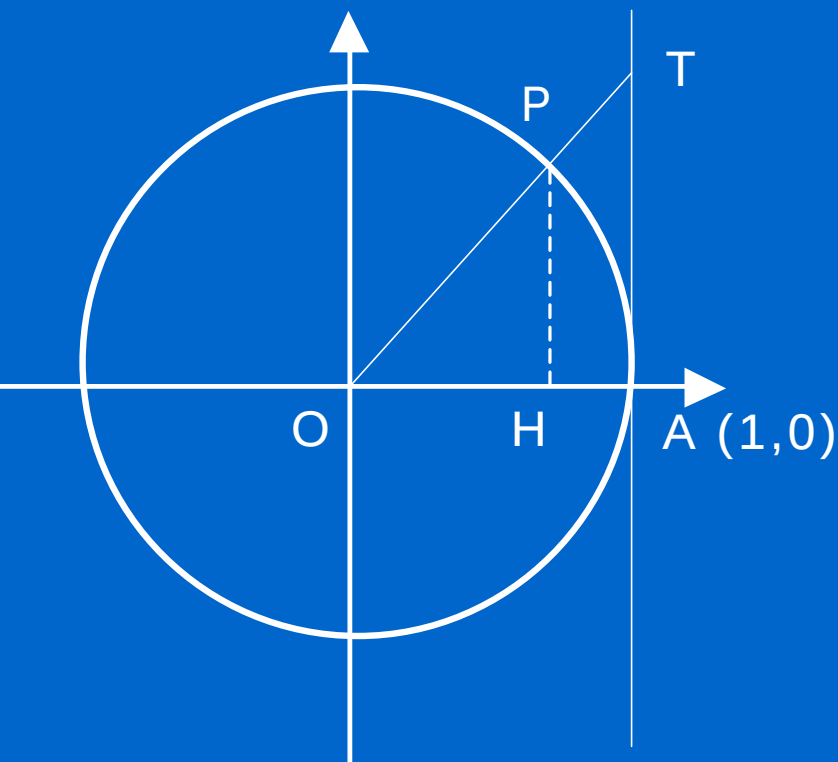


Definizioni goniometriche



$$\text{Cos } \alpha = \text{OH} / \text{OP}$$

$$\text{Sen } \alpha = \text{PH} / \text{OP}$$

$$\text{Tan } \alpha = \text{Sen } \alpha / \text{Cos } \alpha$$

Relazione goniometrica fondamentale

$$\text{OP}^2 = \text{OH}^2 + \text{PH}^2$$

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

$$? \quad \sin \alpha = \pm \sqrt{1 - \cos^2 \alpha}$$

$$? \quad \cos \alpha = \pm \sqrt{1 - \sin^2 \alpha}$$

$$P (\cos \alpha, \sin \alpha)$$

$$\text{OP} = r = 1$$

$$T (1, \tan \alpha)$$

Archi associati

$$\text{sen } (\pi - \alpha) = \text{sen } \alpha$$

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

$$\text{sen } (\pi/2 - \alpha) = \cos \alpha$$

$$\cos (\pi/2 - \alpha) = \text{sen } \alpha$$

$$\text{sen } (2\pi - \alpha) = -\text{sen } \alpha$$

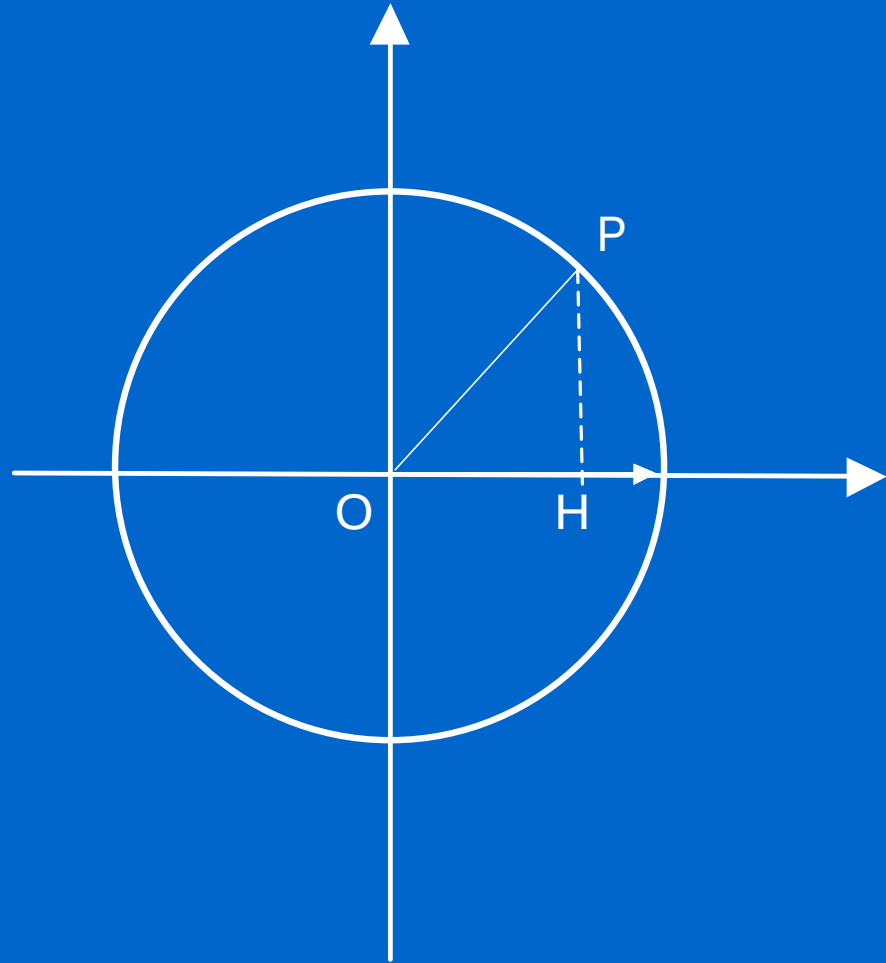
$$\cos (2\pi - \alpha) = \cos \alpha$$

$$\text{sen } (\pi + \alpha) = -\text{sen } \alpha$$

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

$$\text{sen } (\pi/2 + \alpha) = \cos \alpha$$

$$\cos (\pi/2 + \alpha) = -\text{sen } \alpha$$



Angoli particolari

α°	0°	30°	45°	60°	90°
α	0	$\pi / 6$	$\pi / 4$	$\pi / 3$	$\pi / 2$
Cos α	1	$\sqrt{3} / 2$	$\sqrt{2} / 2$	$1 / 2$	0
Sen α	0	$1 / 2$	$\sqrt{2} / 2$	$\sqrt{3} / 2$	1
Tan α	0	$\sqrt{3} / 3$	1	$\sqrt{3}$	8



Formule goniometriche

Formule di addizione

- $\cos(\alpha + \beta) = \cos \alpha \cos \beta - \sin \alpha \sin \beta$
- $\sin(\alpha + \beta) = \sin \alpha \cos \beta + \cos \alpha \sin \beta$
- $\tan(\alpha + \beta) = (\tan \alpha + \tan \beta) / (1 - \tan \alpha \tan \beta)$ $\cos \alpha, \beta, \alpha + \beta \neq 90^\circ + k 180^\circ$

Formule di sottrazione

- $\cos(\alpha - \beta) = \cos \alpha \cos \beta + \sin \alpha \sin \beta$
- $\sin(\alpha - \beta) = \sin \alpha \cos \beta - \cos \alpha \sin \beta$
- $\tan(\alpha - \beta) = (\tan \alpha - \tan \beta) / (1 + \tan \alpha \tan \beta)$ $\cos \alpha, \beta, \alpha + \beta \neq 90^\circ + k 180^\circ$

Formule di duplicazione

- $\cos(2\alpha) = 2\cos^2 \alpha - 1 ; 1 - 2\sin^2 \alpha$
- $\sin(2\alpha) = 2\sin \alpha \cos \alpha$
- $\tan(2\alpha) = 2\tan \alpha / (1 - \tan^2 \alpha)$ $\cos \alpha \neq 45^\circ + k 90^\circ \wedge \alpha \neq 90^\circ + k 180^\circ$

Formule di bisezione

- $\cos(\alpha/2) = \pm \sqrt{(1 + \cos \alpha) / 2}$
- $\sin(\alpha/2) = \pm \sqrt{(1 - \cos \alpha) / 2}$
- $\tan(\alpha/2) = \pm \sqrt{(1 - \cos \alpha) / (1 + \cos \alpha)}$ $\cos \alpha \neq 180^\circ + k 360^\circ \wedge \alpha \neq k 180^\circ$

