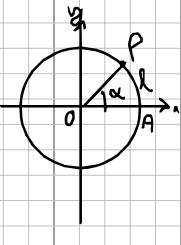


# TRIGONOMETRIA

- LA CIRCONFERENZA GONIOMETRICA HA MISURA  $2\pi$
- UN PUNTO SULLA CIRCONFERENZA POSSO DESCRIVERLO TRAMITE L'ANGOL $\alpha$  RISPETTO ALLE ASCISSE, OPPURE TRAMITE I RADIANI

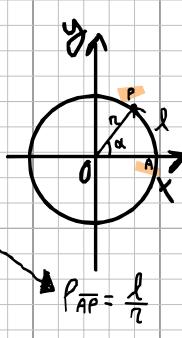
ESEMPIO:



$$\alpha = 45^\circ \quad \text{PERCHÉ } 45^\circ \text{ È } \frac{1}{8} \text{ DELLA CIRCONFERENZA}$$

$$P = \frac{l}{\pi} = \frac{\frac{1}{8} \cdot 2\pi}{\pi} = \frac{1}{4}\pi$$

L'ANGOL $\alpha$  IN GRADI OPPURE I RADIANI SONO LA STESSA INFO!

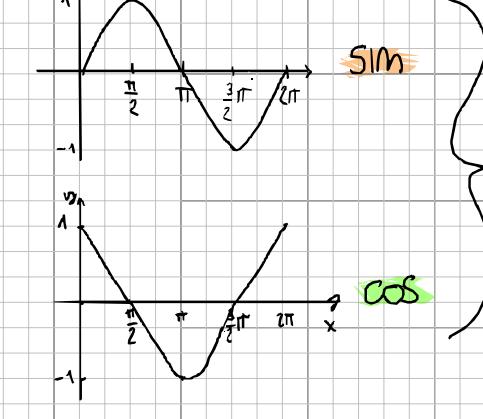


$$P_{AP} = \frac{l}{\pi}$$

## CONVERSIONE $\alpha$ IN RADIANI

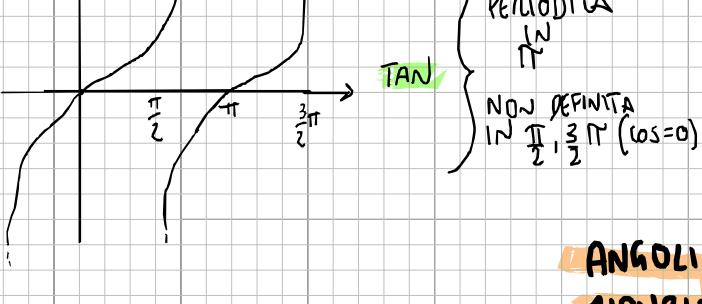
$$\alpha_{\text{RAD}} : \alpha_{\text{gradi}} = 2\pi : 360^\circ$$

## SIN, COS, TAN



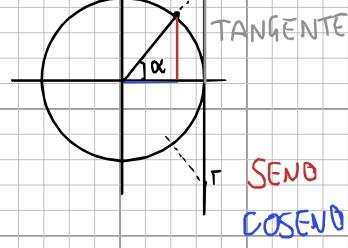
SIN

FUNZIONI PERIODICHE IN  $2\pi$

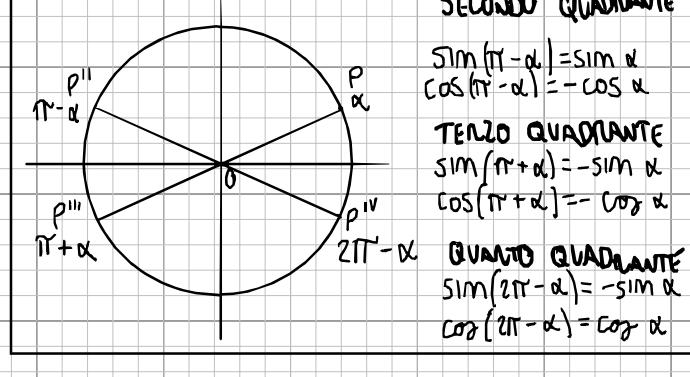


TAN

PERIODICA IN  $\pi$   
NON DEFINITA IN  $\frac{\pi}{2}, \frac{3\pi}{2}$  ( $\cos=0$ )



## ANGOLI ASSOCIATI E RIDUZIONE AL PRIMO QUADRANTE



### SECONDO QUADRANTE

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

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

### TERZO QUADRANTE

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

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

### QUARTO QUADRANTE

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

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

$\alpha$ [RAD]	$\sin \alpha$	$\cos \alpha$
$0 (0^\circ)$	0	1
$\frac{\pi}{6} (30^\circ)$	$\frac{1}{2}$	$\frac{\sqrt{3}}{2}$
$\frac{\pi}{4} (45^\circ)$	$\frac{\sqrt{2}}{2}$	$\frac{\sqrt{2}}{2}$
$\frac{\pi}{3} (60^\circ)$	$\frac{\sqrt{3}}{2}$	$\frac{1}{2}$
$\frac{\pi}{2} (90^\circ)$	1	0

## FORMULE ADDIZIONE, SOTTRAZIONE, DOPPLICAZIONE

### ADDITIONE / SOTTRAZIONE

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

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

$$\text{ESEMPIO: } \sin(15^\circ) = \sin(45^\circ - 30^\circ) = \frac{\sqrt{2}}{2} \cdot \frac{\sqrt{3}}{2} - \frac{\sqrt{2}}{2} \cdot \frac{1}{2} = \frac{\sqrt{6}}{4} - \frac{\sqrt{2}}{4} = \frac{\sqrt{6} - \sqrt{2}}{4}$$

### DOPPLICAZIONE

$$\sin(2\alpha) = 2\sin \alpha \cdot \cos \alpha$$

$$\cos(2\alpha) = \cos^2 \alpha - \sin^2 \alpha$$

$$2\cos^2 \alpha - 1$$

$$1 - 2\sin^2 \alpha$$

$$\text{ESEMPIO: } \sin \alpha = \frac{1}{3}, \text{ TROVARE } \cos(2\alpha)$$

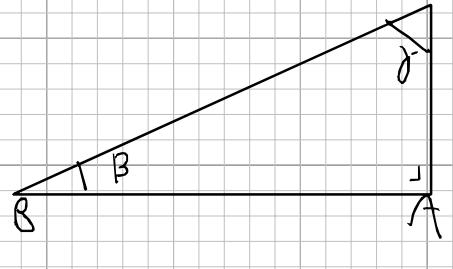
$$\cos(2\alpha) = 1 - 2\sin^2 \alpha = 1 - 2 \cdot \frac{1}{9} = 1 - \frac{2}{9} = \frac{7}{9}$$

### BISEZIONE

$$\sin\left(\frac{\alpha}{2}\right) = \pm \sqrt{\frac{1 - \cos \alpha}{2}}$$

$$\cos\left(\frac{\alpha}{2}\right) = \pm \sqrt{\frac{1 + \cos \alpha}{2}}$$

## TRIGONOMETRIA



$$\sin(\alpha) = \frac{\text{CATETO OPPONTO AD } \alpha}{\text{IPOTENUSA}}$$

$$\cos(\alpha) = \frac{\text{CATETO ADIACENTE AD } \alpha}{\text{IPOTENUSA}}$$

$$\tan(\alpha) = \frac{\text{CATETO OPPONTO AD } \alpha}{\text{CATETO ADIACENTE AD } \alpha}$$

$$\sin \alpha = \frac{\text{CAT OPP}}{\text{IP}}$$

$$\cos \alpha = \frac{\text{CAT AD}}{\text{IP}}$$

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