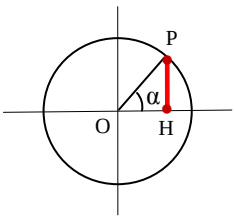
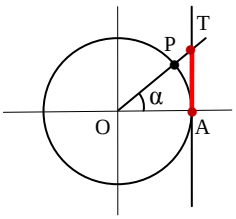
Funzioni goniometriche, relazioni fondamentali e grafici

definizione delle funzioni goniometriche sulla circonferenza goniometrica di centro l'origine degli assi e raggio 1



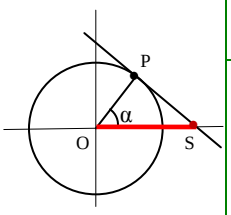
seno α

$$sen\alpha = \frac{\overline{PH}}{\overline{OP}} = \overline{PH}$$



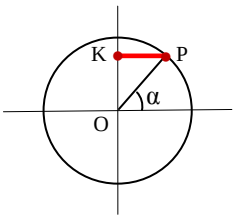
tangente α

$$tg\alpha = \frac{\overline{TA}}{\overline{OP}} = \overline{TA}$$



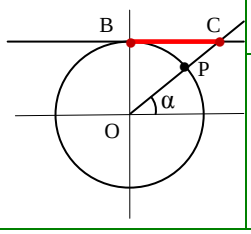
secante α

$$sec\,\alpha = \frac{\overline{OS}}{\overline{OP}} = \overline{OS}$$



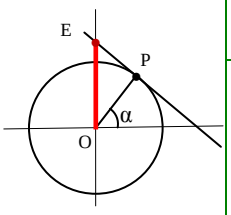
coseno α

$$cos\alpha = \frac{\overline{PK}}{\overline{OP}} = \overline{PK}$$



cotangente α

$$ctg\alpha = \frac{\overline{BC}}{\overline{OP}} = \overline{BC}$$



cosecante α

$$cosec\,\alpha = \frac{\overline{OE}}{\overline{OP}} = \overline{OE}$$

le cinque relazioni fondamentali

$$\boldsymbol{sen^2\alpha + cos^2\alpha = 1}$$

$$\boldsymbol{tg\alpha = \frac{sen\alpha}{cos\alpha}}$$

$$\boldsymbol{ctg\alpha = \frac{cos\alpha}{sen\alpha}}$$

$$\boldsymbol{sec\alpha = \frac{1}{cos\alpha}}$$

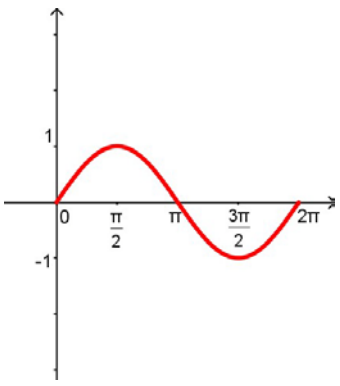
$$\boldsymbol{cosec\alpha = \frac{1}{sen\alpha}}$$

relazioni che esprimono una funzione goniometrica rispetto alle altre

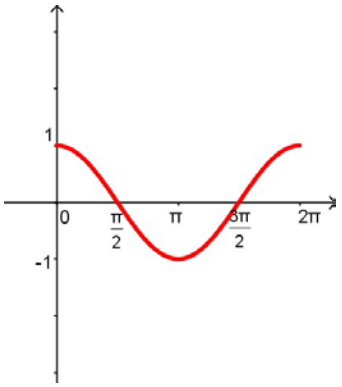
$sen\alpha$ in funzione di …	$cos\alpha$ in funzione di …	$tg\alpha$ in funzione di …	$ctg\alpha$ in funzione di …
$sen\alpha = \pm\sqrt{1 - cos^2\alpha}$	$cos\alpha = \pm\sqrt{1 - sen^2\alpha}$	$tg\alpha = \pm\frac{sen\alpha}{\sqrt{1 - sen^2\alpha}}$	$ctg\alpha = \pm\frac{\sqrt{1 - sen^2\alpha}}{sen\alpha}$
$sen\alpha = \pm\frac{tg\alpha}{\sqrt{1 + tg^2\alpha}}$	$cos\alpha = \pm\frac{1}{\sqrt{1 + tg^2\alpha}}$	$tg\alpha = \pm\frac{\sqrt{1 - cos^2\alpha}}{cos\alpha}$	$ctg\alpha = \pm\frac{cos\alpha}{\sqrt{1 - cos^2\alpha}}$
$sen\alpha = \pm\frac{1}{\sqrt{1 + ctg^2\alpha}}$	$cos\alpha = \pm\frac{ctg\alpha}{\sqrt{1 + ctg^2\alpha}}$	$tg\alpha = \frac{1}{ctg\alpha}$	$ctg\alpha = \frac{1}{tg\alpha}$

il segno + o − va preso a seconda del segno della funzione nel quadrante in cui si trova l'angolo

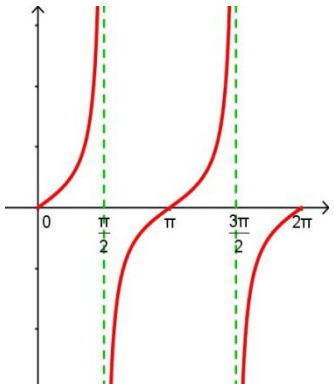
grafici di funzioni goniometriche



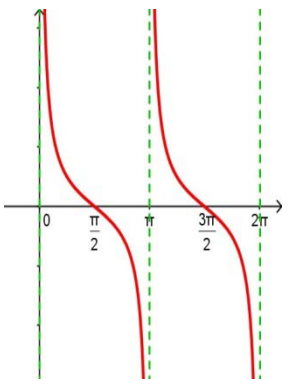
seno



coseno



tangente



cotangente