

Formule goniometriche

addizione e sottrazione	
$\text{sen}(\alpha \pm \beta) = \text{sen}\alpha \cdot \cos\beta \pm \cos\alpha \cdot \text{sen}\beta$	$\text{tg}(\alpha \pm \beta) = \frac{\text{tg}\alpha \pm \text{tg}\beta}{1 \mp \text{tg}\alpha \cdot \text{tg}\beta}$
$\cos(\alpha \pm \beta) = \cos\alpha \cdot \cos\beta \mp \text{sen}\alpha \cdot \text{sen}\beta$	$\text{ctg}(\alpha \pm \beta) = \frac{\text{ctg}\alpha \cdot \text{ctg}\beta \mp 1}{\text{ctg}\beta \pm \text{ctg}\alpha}$

duplicazione	
$\text{sen}2\alpha = 2\text{sen}\alpha \cdot \cos\alpha$	$\text{tg}2\alpha = \frac{2\text{tg}\alpha}{1 - \text{tg}^2\alpha}$
$\cos2\alpha = \cos^2\alpha - \text{sen}^2\alpha$	$\text{ctg}2\alpha = \frac{\text{ctg}^2\alpha - 1}{2\text{ctg}\alpha}$
$\cos2\alpha = 1 - 2\text{sen}^2\alpha$	
$\cos2\alpha = 2\cos^2\alpha - 1$	

triplicazione	
$\text{sen}3\alpha = 3\text{sen}\alpha - 4\text{sen}^3\alpha$	$\text{tg}3\alpha = \frac{3\text{tg}\alpha - \text{tg}^3\alpha}{1 - 3\text{tg}^2\alpha}$
$\cos3\alpha = 4\cos^3\alpha - 3\cos\alpha$	$\text{ctg}3\alpha = \frac{\text{ctg}^3\alpha - 3\text{ctg}\alpha}{3\text{ctg}^2\alpha - 1}$

bisezione	
$\text{sen}\frac{\alpha}{2} = \pm \sqrt{\frac{1 - \cos\alpha}{2}}$	$\text{tg}\frac{\alpha}{2} = \pm \sqrt{\frac{1 - \cos\alpha}{1 + \cos\alpha}} = \frac{\text{sen}\alpha}{1 + \cos\alpha} = \frac{1 - \cos\alpha}{\text{sen}\alpha}$
$\cos\frac{\alpha}{2} = \pm \sqrt{\frac{1 + \cos\alpha}{2}}$	$\text{ctg}\frac{\alpha}{2} = \pm \sqrt{\frac{1 + \cos\alpha}{1 - \cos\alpha}} = \frac{\text{sen}\alpha}{1 - \cos\alpha} = \frac{1 + \cos\alpha}{\text{sen}\alpha}$

parametriche o razionali ($t = \text{tg}\frac{\alpha}{2}$)	
$\text{sen}\alpha = \frac{2t}{1 + t^2}$	$\text{tg}\alpha = \frac{2t}{1 - t^2}$
$\cos\alpha = \frac{1 - t^2}{1 + t^2}$	$\text{ctg}\alpha = \frac{1 - t^2}{2t}$

prostaferesi	
$\text{sen} p + \text{sen} q = 2 \text{sen}\frac{p+q}{2} \cdot \cos\frac{p-q}{2}$	$\text{sen} p - \text{sen} q = 2 \text{sen}\frac{p-q}{2} \cdot \cos\frac{p+q}{2}$
$\cos p + \cos q = 2 \cos\frac{p+q}{2} \cdot \cos\frac{p-q}{2}$	$\cos p - \cos q = -2 \text{sen}\frac{p+q}{2} \cdot \text{sen}\frac{p-q}{2}$

Werner	
$\text{sen}\alpha \cdot \cos\beta = \frac{1}{2} [\text{sen}(\alpha + \beta) + \text{sen}(\alpha - \beta)]$	$\text{sen}\beta \cdot \cos\alpha = \frac{1}{2} [\text{sen}(\alpha + \beta) - \text{sen}(\alpha - \beta)]$
$\cos\alpha \cdot \cos\beta = \frac{1}{2} [\cos(\alpha + \beta) + \cos(\alpha - \beta)]$	$\text{sen}\alpha \cdot \text{sen}\beta = -\frac{1}{2} [\cos(\alpha + \beta) - \cos(\alpha - \beta)]$