

Formule goniometriche

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

duplicazione	
$sen2\alpha = 2sen\alpha \cdot cosa$	$tg2\alpha = \frac{2tg\alpha}{1 - tg^2\alpha}$
$cos2\alpha = cos^2\alpha - sen^2\alpha$	$ctg2\alpha = \frac{ctg^2\alpha - 1}{2ctg\alpha}$
$cos2\alpha = 1 - 2sen^2\alpha$ $cos2\alpha = 2cos^2\alpha - 1$	

triplicazione	
$sen3\alpha = 3sen\alpha - 4sen^3\alpha$	$tg3\alpha = \frac{3tg\alpha - tg^3\alpha}{1 - 3tg^2\alpha}$
$cos3\alpha = 4cos^3\alpha - 3cosa$	$ctg3\alpha = \frac{ctg^3\alpha - 3ctg\alpha}{3ctg^2\alpha - 1}$

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

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

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

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