

## TRIGONOMETRIA

$\cos^2 \alpha + \sin^2 \alpha = 1$ $\operatorname{tg}^2 \alpha + 1 = \sec^2 \alpha$ $1 + \operatorname{cotg}^2 \alpha = \operatorname{cosec}^2 \alpha$	$\sin(a+b) = \sin a \cos b + \cos a \sin b$ $\sin(a-b) = \sin a \cos b - \cos a \sin b$ $\cos(a+b) = \cos a \cos b - \sin a \sin b$ $\cos(a-b) = \cos a \cos b + \sin a \sin b$
Ángulo doble:  $\sin 2a = 2 \sin a \cos a$ $\cos 2a = \cos^2 a - \sin^2 a$ $\operatorname{tg} 2a = \frac{2 \operatorname{tg} a}{1 - \operatorname{tg}^2 a}$	Transformación de productos en sumas:  $\sin a \cos b = \frac{1}{2} [\sin(a+b) + \sin(a-b)]$ $\cos a \sin b = \frac{1}{2} [\sin(a+b) - \sin(a-b)]$ $\cos a \cos b = \frac{1}{2} [\cos(a+b) + \cos(a-b)]$ $\sin a \sin b = \frac{1}{2} [\cos(a+b) - \cos(a-b)]$
Ángulo mitad:  $\cos \frac{\alpha}{2} = \sqrt{\frac{1 + \cos \alpha}{2}}$ $\sin \frac{\alpha}{2} = \sqrt{\frac{1 - \cos \alpha}{2}}$ $\operatorname{tg} \frac{\alpha}{2} = \sqrt{\frac{1 - \cos \alpha}{1 + \cos \alpha}}$	Transformación de sumas en productos:  $\sin \alpha + \sin \beta = 2 \sin \left( \frac{\alpha + \beta}{2} \right) \cos \left( \frac{\alpha - \beta}{2} \right)$ $\sin \alpha - \sin \beta = 2 \cos \left( \frac{\alpha + \beta}{2} \right) \sin \left( \frac{\alpha - \beta}{2} \right)$ $\cos \alpha + \cos \beta = 2 \cos \left( \frac{\alpha + \beta}{2} \right) \cos \left( \frac{\alpha - \beta}{2} \right)$ $\cos \alpha - \cos \beta = -2 \sin \left( \frac{\alpha + \beta}{2} \right) \sin \left( \frac{\alpha - \beta}{2} \right)$