

# ΤΥΠΟΙ

$a \pm b$

$$\left. \begin{aligned} \sin(a \pm b) &= \sin a \cos b \pm \cos a \cdot \sin b \\ \cos(a \pm b) &= \cos a \cos b \mp \sin a \cdot \sin b \\ \tan(a \pm b) &= \frac{\tan a \pm \tan b}{1 \mp \tan a \cdot \tan b} \\ \cot(a \pm b) &= \frac{\cot a \cdot \cot b \mp 1}{\cot b \pm \cot a} \quad !!! \end{aligned} \right\} \rightarrow$$

$2a$

$$\begin{aligned} \sin 2a &= 2 \sin a \cos a \\ \cos 2a &= \cos^2 a - \sin^2 a = \begin{cases} 2 \cos^2 a - 1 \\ 2 \sin^2 a - 1 \end{cases} \\ \tan 2a &= \frac{2 \tan a}{1 - \tan^2 a} \\ \cot 2a &= \frac{\cot^2 a - 1}{2 \cot a} \end{aligned}$$

$$\begin{aligned} \rightarrow \sin(a+b) \cdot \sin(a-b) &= \sin^2 a - \sin^2 b \\ \cos(a+b) \cdot \cos(a-b) &= \cos^2 a - \sin^2 b \end{aligned}$$

$$\begin{aligned} \boxed{3a} \rightarrow \sin 3a &= 3 \sin a - 4 \sin^3 a & \tan 3a &= \frac{3 \tan a - \tan^3 a}{1 - 3 \tan^2 a} \\ \cos 3a &= 4 \cos^3 a - 3 \cos a \end{aligned}$$

## ΣΥΝΑΡΤΗΣΕΙΣ

$\cos 2a$

$\tan \frac{a}{2}$

$$\begin{aligned} \sin^2 a &= \frac{1 - \cos 2a}{2} & \cos^2 a &= \frac{1 + \cos 2a}{2} & \sin a &= \frac{2 \tan \frac{a}{2}}{1 + \tan^2 \frac{a}{2}} & \cos a &= \frac{1 - \tan^2 \frac{a}{2}}{1 + \tan^2 \frac{a}{2}} \\ \tan^2 a &= \frac{1 - \cos 2a}{1 + \cos 2a} & \cot^2 a &= \frac{1 + \cos 2a}{1 - \cos 2a} & \tan a &= \frac{2 \tan \frac{a}{2}}{1 - \tan^2 \frac{a}{2}} & \cot a &= \frac{1 - \tan^2 \frac{a}{2}}{2 \tan \frac{a}{2}} \end{aligned}$$

## Μετασχηματισμοί

Σε γινόμενο

Σε άθροισμα

$$\begin{aligned} \sin a \pm \sin b &= 2 \sin \frac{a \pm b}{2} \cos \frac{a \mp b}{2} & 2 \sin a \cos b &= \sin(a+b) + \sin(a-b) \\ \cos a + \cos b &= 2 \cos \frac{a+b}{2} \cos \frac{a-b}{2} & 2 \cos a \cos b &= \cos(a+b) + \cos(a-b) \\ \cos a - \cos b &= 2 \sin \frac{a+b}{2} \sin \frac{b-a}{2} \quad !!! & 2 \sin a \sin b &= \cos(a-b) - \cos(a+b) \end{aligned}$$

$$\begin{aligned} \tan a \pm \tan b &= \frac{\sin(a \pm b)}{\cos a \cdot \cos b} \\ \cot a \pm \cot b &= \frac{\sin(b \mp a)}{\sin a \cdot \sin b} \quad !!! \end{aligned}$$

$$\begin{aligned} \rightarrow 1 \pm \sin a &= \sin \frac{\pi}{2} \pm \sin a = \dots, \quad \sin a + \cos b = \sin a + \sin \left( \frac{\pi}{2} - a \right) = \dots \\ 1 \pm \cos a &= \begin{cases} 2 \cos^2(a/2) \\ 2 \sin^2(a/2) \end{cases} \end{aligned}$$