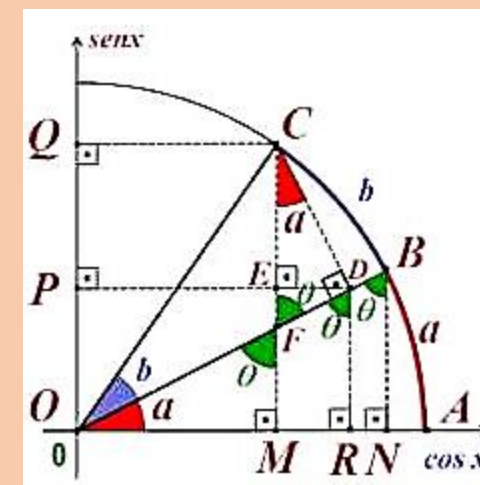




CENTRO EDUCACIONAL MARAPENDI – CEMP

GEOMETRIA – Prof. Clovis Reis

TRANSFORMAÇÕES TRIGONOMÉTRICAS



1. ADIÇÃO E SUBTRAÇÃO DE ARCOS

$$\sin (a \pm b) = \sin a \cdot \cos b \pm \sin b \cdot \cos a$$

$$\cos (a \pm b) = \cos a \cdot \cos b \mp \sin b \cdot \sin a$$

$$\operatorname{tg} (a \pm b) = \frac{\operatorname{tg} a \pm \operatorname{tg} b}{1 \mp \operatorname{tg} a \cdot \operatorname{tg} b}$$

RESUMINDO

$$\text{sen}(a + b) = \text{sen}(a) \cdot \cos(b) + \text{sen}(b) \cdot \cos(a)$$

$$\text{sen}(a - b) = \text{sen}(a) \cdot \cos(b) - \text{sen}(b) \cdot \cos(a)$$

$$\cos(a + b) = \cos(a) \cdot \cos(b) - \text{sen}(a) \cdot \text{sen}(b)$$

$$\cos(a - b) = \cos(a) \cdot \cos(b) + \text{sen}(a) \cdot \text{sen}(b)$$

$$\text{tg}(a + b) = \frac{\text{tg}(a) + \text{tg}(b)}{1 - \text{tg}(a) \cdot \text{tg}(b)}$$

$$\text{tg}(a - b) = \frac{\text{tg}(a) - \text{tg}(b)}{1 + \text{tg}(a) \cdot \text{tg}(b)}$$

2. FÓRMULAS DO ARCO DUPLO

Seno do arco duplo

$$\begin{array}{r} \text{sen}(a + b) = \text{sen } a \cos b + \text{sen } b \cos a \\ \downarrow \qquad \qquad \downarrow \qquad \downarrow \\ \text{sen}(a + a) = \text{sen } a \cos a + \text{sen } a \cos a \end{array}$$

$$\text{sen } 2a = 2 \text{ sen } a \cos a$$

Cosseno do arco duplo

$$\begin{array}{r} \cos(a + b) = \cos a \cos b - \text{sen } a \text{ sen } b \\ \downarrow \qquad \qquad \downarrow \qquad \downarrow \\ \cos(a + a) = \cos a \cos a - \text{sen } a \text{ sen } a \end{array}$$

$$\cos 2a = \cos^2 a - \text{sen}^2 a$$

Lembrando que

$$\cos^2 a = 1 - \sin^2 a \quad \text{e} \quad \sin^2 a = 1 - \cos^2 a$$

podemos escrever $\cos 2a$ em função somente de $\cos a$,
ou somente de $\sin a$.

- $\cos 2a = \cos^2 a - \sin^2 a$
 $\cos 2a = \cos^2 a - (1 - \cos^2 a)$

$$\cos 2a = 2 \cos^2 a - 1$$

- $\cos 2a = \cos^2 a - \sin^2 a$
 $\cos 2a = (1 - \sin^2 a) - \sin^2 a$

$$\cos 2a = 1 - 2 \sin^2 a$$

Tangente do arco duplo

$$\begin{aligned} \operatorname{tg}(a + b) &= \frac{\operatorname{tg} a + \operatorname{tg} b}{1 - \operatorname{tg} a \operatorname{tg} b} \\ \operatorname{tg}(a + a) &= \frac{\operatorname{tg} a + \operatorname{tg} a}{1 - \operatorname{tg} a \operatorname{tg} a} \end{aligned}$$

$$\operatorname{tg} 2a = \frac{2 \operatorname{tg} a}{1 - \operatorname{tg}^2 a}$$

RESUMINDO

$$\text{sen}(2a) = 2.\text{sen}a . \cos a$$

$$\cos(2a) = \begin{cases} (\cos a)^2 - (\text{sen}a)^2 \\ 2.(\cos a)^2 - 1 \\ 1 - 2.(\text{sen}a)^2 \end{cases}$$

$$\text{tg}(2a) = \frac{(2.\text{tga})}{(1 - (\text{tga})^2)}$$

Referências:

<https://brainly.com.br/>

<https://slideplayer.com.br/>

<http://mat9o-thiagokyamamoto.blogspot.com/>