

potencias y raíces

logaritmos

$$a^b \cdot a^c = a^{b+c}$$

$$\frac{a^b}{a^c} = a^{b-c}$$

$$(a^b)^c = a^{b \cdot c}$$

$$a^{-b} = \frac{1}{a^b}$$

$$\sqrt[b]{a^c} = \sqrt[c]{a^b}$$

$$\sqrt{a \cdot b} = \sqrt{a} \cdot \sqrt{b}$$

$$\sqrt{\frac{a}{b}} = \frac{\sqrt{a}}{\sqrt{b}}$$

$$\sqrt{a \pm b} \neq \sqrt{a} \pm \sqrt{b}$$

$$\log_a b = c \Leftrightarrow a^c = b$$

$$\log(a \cdot b) = \log a + \log b$$

$$\log\left(\frac{a}{b}\right) = \log a - \log b$$

$$\log(a^b) = b \cdot \log a$$

$$\log_a b = \frac{\log_c b}{\log_c a}$$

trigonometría

básicas

$$\text{sen}^2 \alpha + \text{cos}^2 \alpha = 1$$

$$\text{tg} \alpha = \frac{\text{sen} \alpha}{\text{cos} \alpha}$$

$$1 + \text{tg}^2 \alpha = \frac{1}{\text{cos}^2 \alpha}$$

ángulo doble

$$\text{sen} 2\alpha = 2 \text{sen} \alpha \cdot \text{cos} \alpha$$

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

$$\text{tg} 2\alpha = \frac{2 \text{tg} \alpha}{1 - \text{tg}^2 \alpha}$$

ángulo mitad

$$\text{sen} \frac{\alpha}{2} = \pm \sqrt{\frac{1 - \text{cos} \alpha}{2}}$$

$$\text{cos} \frac{\alpha}{2} = \pm \sqrt{\frac{1 + \text{cos} \alpha}{2}}$$

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

ángulo suma

$$\text{sen}(\alpha + \beta) = \text{sen} \alpha \cdot \text{cos} \beta + \text{cos} \alpha \cdot \text{sen} \beta$$

$$\text{cos}(\alpha + \beta) = \text{cos} \alpha \cdot \text{cos} \beta - \text{sen} \alpha \cdot \text{sen} \beta$$

$$\text{tg}(\alpha + \beta) = \frac{\text{tg} \alpha + \text{tg} \beta}{1 - \text{tg} \alpha \cdot \text{tg} \beta}$$

ángulo resta

$$\text{sen}(\alpha - \beta) = \text{sen} \alpha \cdot \text{cos} \beta - \text{cos} \alpha \cdot \text{sen} \beta$$

$$\text{cos}(\alpha - \beta) = \text{cos} \alpha \cdot \text{cos} \beta + \text{sen} \alpha \cdot \text{sen} \beta$$

$$\text{tg}(\alpha - \beta) = \frac{\text{tg} \alpha - \text{tg} \beta}{1 + \text{tg} \alpha \cdot \text{tg} \beta}$$

suma y resta de razones

$$\text{sen} \alpha + \text{sen} \beta = 2 \cdot \text{sen} \frac{\alpha + \beta}{2} \cdot \text{cos} \frac{\alpha - \beta}{2}$$

$$\text{sen} \alpha - \text{sen} \beta = 2 \cdot \text{cos} \frac{\alpha + \beta}{2} \cdot \text{sen} \frac{\alpha - \beta}{2}$$

$$\text{cos} \alpha + \text{cos} \beta = 2 \cdot \text{cos} \frac{\alpha + \beta}{2} \cdot \text{cos} \frac{\alpha - \beta}{2}$$

$$\text{cos} \alpha - \text{cos} \beta = -2 \cdot \text{sen} \frac{\alpha + \beta}{2} \cdot \text{sen} \frac{\alpha - \beta}{2}$$

$$\text{tg} \alpha + \text{tg} \beta = \frac{\text{sen}(\alpha + \beta)}{\text{cos} \alpha \cdot \text{cos} \beta}; \text{tg} \alpha - \text{tg} \beta = \frac{\text{sen}(\alpha - \beta)}{\text{cos} \alpha \cdot \text{cos} \beta}$$

producto de razones

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

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

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

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