

FORMULARIO DE TRIGONOMETRÍA

1.- $\text{sen} \alpha = \frac{\text{cateto opuesto a } \alpha}{\text{hipotenusa}}$

2.- $\text{cos} \alpha = \frac{\text{cateto adyacente a } \alpha}{\text{hipotenusa}}$

3.- $\text{tg} \alpha = \frac{\text{cateto opuesto a } \alpha}{\text{cateto adyacente a } \alpha} = \frac{\text{sen} \alpha}{\text{cos} \alpha}$

4.- $4.\text{cosec} \alpha = \frac{1}{\text{sen} \alpha}$

5.- $\text{sec} \alpha = \frac{1}{\text{cos} \alpha}$

6.- $\text{cot} \alpha = \frac{1}{\text{tg} \alpha} = \frac{\text{cos} \alpha}{\text{sen} \alpha}$

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

8.- $\text{tg}^2 \alpha + 1 = \text{sec}^2 \alpha$

9.- $\text{cot}^2 \alpha + 1 = \text{cosec}^2 \alpha$

10.- $\text{sen} 2\alpha = 2 \text{sen} \alpha \text{cos} \alpha$

11.- $\text{cos} 2\alpha = \text{cos}^2 \alpha - \text{sen}^2 \alpha = 2 \text{cos}^2 \alpha - 1 = 1 - 2 \text{sen}^2 \alpha$

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

13.- $\text{sen} \alpha = 2 \text{sen} \left(\frac{\alpha}{2} \right) \text{cos} \left(\frac{\alpha}{2} \right)$

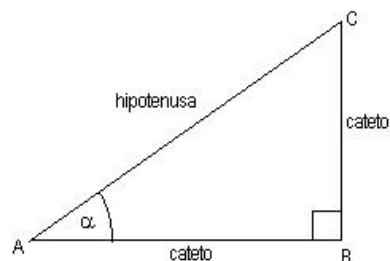
14.- $\text{cos} \alpha = \text{cos}^2 \left(\frac{\alpha}{2} \right) - \text{sen}^2 \left(\frac{\alpha}{2} \right) = 2 \text{cos}^2 \left(\frac{\alpha}{2} \right) - 1 = 1 - \text{sen}^2 \left(\frac{\alpha}{2} \right)$

15.- $\text{sen} \left(\frac{\alpha}{2} \right) = 2 \text{sen} \left(\frac{\alpha}{4} \right) \text{cos} \left(\frac{\alpha}{4} \right)$

16.- $\text{cos} \left(\frac{\alpha}{2} \right) = \text{cos}^2 \left(\frac{\alpha}{4} \right) - \text{sen}^2 \left(\frac{\alpha}{4} \right) = 2 \text{cos}^2 \left(\frac{\alpha}{4} \right) - 1 = 1 - 2 \text{sen}^2 \left(\frac{\alpha}{4} \right)$

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

18.- $\text{cos} \alpha = \sqrt{\frac{1 + \text{cos} 2\alpha}{2}}$



$$19.- \tan \alpha = \sqrt{\frac{1 - \cos 2\alpha}{1 + \cos 2\alpha}}$$

$$20.- \sin^2 \alpha = \frac{1 - \cos 2\alpha}{2}$$

$$21.- \cos^2 \alpha = \frac{1 + \cos 2\alpha}{2}$$

$$22.- \operatorname{tg}^2 \alpha = \frac{1 - \cos 2\alpha}{1 + \cos 2\alpha}$$

$$23.- \sin\left(\frac{\alpha}{2}\right) = \sqrt{\frac{1 - \cos \alpha}{2}}$$

$$24.- \cos\left(\frac{\alpha}{2}\right) = \sqrt{\frac{1 + \cos \alpha}{2}}$$

$$25.- \operatorname{tg}\left(\frac{\alpha}{2}\right) = \sqrt{\frac{1 - \cos \alpha}{1 + \cos \alpha}}$$

$$26.- \sin(\alpha \pm \beta) = \sin \alpha \cos \beta \pm \cos \alpha \sin \beta$$

$$27.- \cos(\alpha \pm \beta) = \cos \alpha \cos \beta \mp \sin \alpha \sin \beta$$

$$28.- \operatorname{tg}(\alpha + \beta) = \frac{\operatorname{tg} \alpha + \operatorname{tg} \beta}{1 - \operatorname{tg} \alpha \operatorname{tg} \beta}$$

$$29.- \operatorname{tg}(\alpha - \beta) = \frac{\operatorname{tg} \alpha - \operatorname{tg} \beta}{1 + \operatorname{tg} \alpha \operatorname{tg} \beta}$$

$$30.- \sin \alpha + \sin \beta = 2 \sin\left(\frac{\alpha + \beta}{2}\right) \cos\left(\frac{\alpha - \beta}{2}\right)$$

$$31.- \sin \alpha - \sin \beta = 2 \cos\left(\frac{\alpha + \beta}{2}\right) \sin\left(\frac{\alpha - \beta}{2}\right)$$

$$32.- \cos \alpha + \cos \beta = 2 \cos\left(\frac{\alpha + \beta}{2}\right) \cos\left(\frac{\alpha - \beta}{2}\right)$$

$$33.- \cos \alpha - \cos \beta = -2 \sin\left(\frac{\alpha + \beta}{2}\right) \sin\left(\frac{\alpha - \beta}{2}\right)$$

$$34.- \sin \alpha \cos \beta = \frac{\sin(\alpha + \beta) + \sin(\alpha - \beta)}{2}$$

$$35.- \cos \alpha \sin \beta = \frac{\sin(\alpha + \beta) - \sin(\alpha - \beta)}{2}$$

$$36.- \cos \alpha \cos \beta = \frac{\cos(\alpha + \beta) + \cos(\alpha - \beta)}{2}$$

$$37.- \operatorname{sen} \alpha \operatorname{sen} \beta = \frac{\cos(\alpha - \beta) - \cos(\alpha + \beta)}{2}$$

$$38.- \operatorname{sen}(-\alpha) = -\operatorname{sen} \alpha$$

$$39.- \cos(-\alpha) = \cos \alpha$$

$$40.- \operatorname{tg}(-\alpha) = -\operatorname{tg} \alpha$$

$$41.- \operatorname{cot} g(-\alpha) = -\operatorname{cot} g \alpha$$

$$42.- \operatorname{sec}(-\alpha) = \operatorname{sec} \alpha$$

$$43.- \operatorname{cos ec}(-\alpha) = -\operatorname{cos ec} \alpha$$

$$44.- \operatorname{sen}\left(\frac{\pi}{2} - \alpha\right) = \cos \alpha$$

$$45.- \cos\left(\frac{\pi}{2} - \alpha\right) = \operatorname{sen} \alpha$$

$$46.- \operatorname{tg}\left(\frac{\pi}{2} - \alpha\right) = \operatorname{cot} g \alpha$$

$$47.- \operatorname{cot} g\left(\frac{\pi}{2} - \alpha\right) = \operatorname{tg} \alpha$$

$$48.- \operatorname{sec}\left(\frac{\pi}{2} - \alpha\right) = \operatorname{cos ec} \alpha$$

$$49.- \operatorname{cos ec}\left(\frac{\pi}{2} - \alpha\right) = \operatorname{sec} \alpha$$

$$50.- \cos(kx) = \frac{e^{ikx} + e^{-ikx}}{2} \quad \text{donde } k = \text{constante; } i = \sqrt{-1}$$

$$51.- \operatorname{sen}(kx) = \frac{e^{ikx} - e^{-ikx}}{2i}$$

$$52.- \operatorname{cosh}(kx) = \frac{e^{kx} + e^{-kx}}{2}$$

$$53.- \operatorname{sinh}(kx) = \frac{e^{kx} - e^{-kx}}{2}$$