# TRIGONOMETRÍA

| | $0^0$ | $30^0$ | $45^0$ | $60^0$ | $90^0$ | $180^0$ | $270^0$ | $360^0$ |
|---|---|---|---|---|---|---|---|---|
| $\text{sen}\alpha$ | 0 | $1/2$ | $\sqrt{2}/2$ | $\sqrt{3}/2$ | 1 | 0 | $-1$ | 0 |
| $\cos\alpha$ | 1 | $\sqrt{3}/2$ | $\sqrt{2}/2$ | $1/2$ | 0 | $-1$ | 0 | 1 |
| $\text{tg}\alpha$ | 0 | $\sqrt{3}/3$ | 1 | $\sqrt{3}$ | $+\infty$ | 0 | $-\infty$ | 0 |



| | IDENTIDADES RECÍPROCAS | IDENTIDADES DE PITÁGORAS |
|---|---|---|
| $\text{sen }\alpha = \frac{\text{Cat.op.}}{\text{Hip.}}$ | $\text{cosec }\alpha = \frac{1}{\text{sen}\alpha} = \frac{\text{Hip.}}{\text{Cat.op.}}$ | $\text{sen}^2\alpha + \cos^2\alpha = 1$ |
| $\cos\alpha = \frac{\text{Cat.cont.}}{\text{Hip.}}$ | $\sec\alpha = \frac{1}{\cos\alpha} = \frac{\text{Hip.}}{\text{Cat.cont.}}$ | $1 + \text{tg}^2\alpha = \sec^2\alpha$ |
| $\text{tg }\alpha = \frac{\text{sen}\alpha}{\cos\alpha} = \frac{\text{Cat.op.}}{\text{Cat.cont.}}$ | $\text{cotg }\alpha = \frac{1}{\text{tg}\alpha} = \frac{\text{Cat.cont.}}{\text{Cat.op.}}$ | $1 + \text{cotg}^2 = \text{cosec}^2\alpha$ |
| ÁNGULO MITAD | ÁNGULO DOBLE | REDUCCIÓN DE POTENCIAS |
| $\text{sen}\left(\frac{\alpha}{2}\right) = \pm\sqrt{\frac{1-\cos\alpha}{2}}$ | $\text{sen }2\alpha = 2\cdot\text{sen}\alpha\cdot\cos\alpha$ | $\text{sen}^2\alpha = \frac{1-\cos2\alpha}{2}$ |
| $\cos\left(\frac{\alpha}{2}\right) = \pm\sqrt{\frac{1+\cos\alpha}{2}}$ | $\cos 2\alpha = \cos^2\alpha - \text{sen}^2\alpha$ | $\cos^2\alpha = \frac{1+\cos2\alpha}{2}$ |
| $\text{tg}\left(\frac{\alpha}{2}\right) = \pm\sqrt{\frac{1-\cos\alpha}{1+\cos\alpha}}$ | $\text{tg }2\alpha = \frac{2\cdot\text{tg}\alpha}{1-\text{tg}^2\alpha}$ | $\text{tg}^2\alpha = \frac{1-\cos2\alpha}{1+\cos2\alpha}$ |

| FÓRMULAS SUMA – PRODUCTO | FÓRMULAS PRODUCTO – SUMA |
|---|---|
| $\text{sen}\alpha + \text{sen}\phi = 2\text{sen}\left(\frac{\alpha+\phi}{2}\right)\cos\left(\frac{\alpha-\phi}{2}\right)$ | $\text{sen}\alpha\cdot\text{sen}\phi = \frac{1}{2}\left[\cos(\alpha-\phi) - \cos(\alpha+\phi)\right]$ |
| $\text{sen}\alpha - \text{sen}\phi = 2\cos\left(\frac{\alpha+\phi}{2}\right)\text{sen}\left(\frac{\alpha-\phi}{2}\right)$ | $\cos\alpha\cdot\cos\phi = \frac{1}{2}\left[\cos(\alpha-\phi) + \cos(\alpha+\phi)\right]$ |
| $\cos\alpha + \cos\phi = 2\cos\left(\frac{\alpha+\phi}{2}\right)\cos\left(\frac{\alpha-\phi}{2}\right)$ | $\text{sen}\alpha\cdot\cos\phi = \frac{1}{2}\left[\text{sen}(\alpha+\phi) + \text{sen}(\alpha-\phi)\right]$ |
| $\cos\alpha - \cos\phi = -2\text{sen}\left(\frac{\alpha+\phi}{2}\right)\text{sen}\left(\frac{\alpha-\phi}{2}\right)$ | $\cos\alpha\cdot\text{sen}\phi = \frac{1}{2}\left[\text{sen}(\varepsilon+\phi) - \text{sen}(\alpha-\phi)\right]$ |

| $\text{tg}(\alpha\pm\phi)$ | $\text{sen}(\alpha\pm\phi)$ | $\cos(\alpha\pm\phi)$ |
|---|---|---|
| $\text{tg}(\alpha+\phi) = \frac{\text{tg}\alpha+\text{tg}\phi}{1-\text{tg}\alpha\cdot\text{tg}\phi}$ | $\text{sen}(\alpha+\phi) = \text{sen}\alpha\cdot\cos\phi + \cos\alpha\cdot\text{sen}\phi$ | $\cos(\alpha+\phi) = \cos\alpha\cdot\cos\phi - \text{sen}\alpha\cdot\text{sen}\phi$ |
| $\text{tg}(\alpha-\phi) = \frac{\text{tg}\alpha-\text{tg}\phi}{1+\text{tg}\alpha\cdot\text{tg}\phi}$ | $\text{sen}(\alpha-\phi) = \text{sen}\alpha\cdot\cos\phi - \cos\alpha\cdot\text{sen}\phi$ | $\cos(\alpha-\phi) = \cos\alpha\cdot\cos\phi + \text{sen}\alpha\cdot\text{sen}\phi$ |

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