IDENTIDADES TRIGONOMÉTRICAS

Funciones trigonométricas

$$sen\ z = \frac{co}{h} \qquad csc\ z = \frac{h}{co}$$

$$cos\ z = \frac{ca}{h} \qquad sec\ z = \frac{h}{ca}$$

$$tan\ z = \frac{co}{ca} \qquad cot\ z = \frac{ca}{co}$$

Identidades reciprocas

$$sen\ z = \frac{1}{csc\ z} \qquad csc\ z = \frac{1}{sen\ z}$$

$$cos\ z = \frac{1}{sec\ z} \qquad sec\ z = \frac{1}{cos\ z}$$

$$tan\ z = \frac{1}{cot\ z} \qquad cot\ z = \frac{1}{tan\ z}$$

Identidades por cociente

$$sen\ z = \frac{cos\ z}{cot\ z} = \frac{tan\ z}{sec\ z} \qquad csc\ z = \frac{sec\ z}{tan\ z} = \frac{cot\ z}{cos\ z}$$

$$cos\ z = \frac{sen\ z}{tan\ z} = \frac{cot\ z}{csc\ z} \qquad sec\ z = \frac{csc\ z}{cot\ z} = \frac{tan\ z}{sen\ z}$$

$$tan\ z = \frac{sen\ z}{cos\ z} = \frac{sec\ z}{csc\ z} \qquad cot\ z = \frac{cos\ z}{sen\ z} = \frac{csc\ z}{sec\ z}$$

Identidades pitagóricas

$$sen^2\ z + cos^2\ z = 1 \qquad sec^2\ z - tan^2\ z = 1 \qquad csc^2\ z - cot^2\ z = 1$$

$$sen^2 z = 1 - cos^2 z \qquad sec^2 z = 1 + tan^2 z \qquad csc^2 z = 1 + cot^2 z$$

$$cos^2 z = 1 - sen^2 z \qquad tan^2 z = sec^2 z - 1 \qquad cot^2 z = csc^2 z - 1$$

Ángulos dobles

$$cos\ 2z = cos^2 z - sen^2 z$$

$$sen\ 2z = 2\ sen\ z\ cos\ z$$

$$sen^2 z = \frac{1}{2}(1 - cos\ 2z)$$

$$cos^2 z = \frac{1}{2}(1 + cos\ 2z)$$

$$tan\ 2z = \frac{2\ tan\ z}{1 - tan^2 z}$$

$$tan^2 z = \frac{1 - cos\ 2z}{1 + cos\ 2z}$$

Ángulos medios

$$sen\ \propto = 2sen\frac{\propto}{2}cos\frac{\propto}{2}$$

$$cos\ \propto = cos^2\frac{\propto}{2} - sen^2\frac{\propto}{2}$$

$$sen^2\frac{\propto}{2} = \frac{1 - cos\ \propto}{2}$$

$$cos^2\frac{\propto}{2} = \frac{1 + cos\ \propto}{2}$$

$$tan^2\frac{\propto}{2} = \frac{1 - cos\ \propto}{1 + cos\ \propto}$$

$$tan\frac{\propto}{2} = \frac{sen\ \propto}{1 + cos\ \propto} = \frac{1 - cos\ \propto}{sen\ \propto}$$

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Reducción de potencias

$$sen^3 z = \frac{3\ sen\ z - sen\ 3z}{4} \qquad cos^3 z = \frac{3\cos z + \cos 3z}{4}$$

$$sen^4 z = \frac{3 - 5\ cos\ 2z + cos\ 4z}{8} \qquad cos^4 z = \frac{3 + 4\cos 2z + \cos 4z}{8}$$

$$sen^5 z = \frac{10\ sen\ z - 5\ sen\ 3z + sen\ 5z}{16} \qquad cos^5 z = \frac{10\cos z + 5\cos 3z + \cos 5z}{16}$$

Identidades por argumento seno y coseno

$$2\ sen\ a \cdot \cos b = sen(a+b) + sen(a-b)$$

$$2\ cos\ a \cdot sen\ b = sen(a+b) - sen(a-b)$$

$$2\ cos\ a \cdot \cos b = cos(a+b) + cos(a-b)$$

$$-2\ sen\ a \cdot \cos b = cos(a+b) - cos(a-b)$$

$$sen(a+b) \cdot sen(a-b) = sen^2 a - sen^2 b$$

$$cos(a+b) \cdot cos(a-b) = cos^2 a - cos^2 b$$

Identidades con argumento negativo

$$\cos(-z) = \cos z \qquad \sec(-z) = \sec z$$

$$sen\ (-z) = -sen\ z \qquad \csc(-z) = -\csc z$$

$$\tan(-z) = -\tan z \qquad \cot(-z) = -\cot z$$