



## Fórmulas trigonométricas úteis

1.  $\operatorname{sen}^2 x + \cos^2 x = 1$ .

2.  $\operatorname{tg} x = \frac{\operatorname{sen} x}{\cos x}, \quad \operatorname{cotg} x = \frac{\cos x}{\operatorname{sen} x}$ .

3.  $\sec x = \frac{1}{\cos x}, \quad \operatorname{cosec} x = \frac{1}{\operatorname{sen} x}$ .

4.  $\operatorname{sen} 2x = 2 \operatorname{sen} x \cos x$ .

5.  $\cos 2x = \cos^2 x - \operatorname{sen}^2 x$ .

6.  $\cos^2 x = \frac{1 + \cos 2x}{2}, \quad \operatorname{sen}^2 x = \frac{1 - \cos 2x}{2}$ .

	$\pi/6$	$\pi/4$	$\pi/3$
sen	$1/2$	$\sqrt{2}/2$	$\sqrt{3}/2$
cos	$\sqrt{3}/2$	$\sqrt{2}/2$	$1/2$

	$0$	$\pi/2$	$\pi$	$3\pi/2$
sen	$0$	$1$	$0$	$-1$
cos	$1$	$0$	$-1$	$0$

## Fórmulas hiperbólicas úteis

$$\begin{array}{lcl} \operatorname{sh} : \mathbb{R} & \longrightarrow & \mathbb{R} \\ x & \longmapsto & \frac{e^x - e^{-x}}{2} \end{array}$$

$$\begin{array}{lcl} \operatorname{ch} : \mathbb{R} & \longrightarrow & \mathbb{R} \\ x & \longmapsto & \frac{e^x + e^{-x}}{2} \end{array}$$

1.  $\operatorname{ch}^2 x - \operatorname{sh}^2 x = 1$ .

2.  $\operatorname{th} x = \frac{\operatorname{sh} x}{\operatorname{ch} x}, \quad \operatorname{coth} x = \frac{\operatorname{ch} x}{\operatorname{sh} x}$ .

3.  $\operatorname{sech} x = \frac{1}{\operatorname{ch} x}, \quad \operatorname{cosech} x = \frac{1}{\operatorname{sh} x}$ .

4.  $\operatorname{sh} 2x = 2 \operatorname{sh} x \operatorname{ch} x$ .

5.  $\operatorname{ch} 2x = \operatorname{ch}^2 x + \operatorname{sh}^2 x$ .

6.  $\operatorname{ch}^2 x = \frac{\operatorname{ch} 2x + 1}{2}, \quad \operatorname{sh}^2 x = \frac{\operatorname{ch} 2x - 1}{2}$ .