Universidade do Minho

Departamento de Matemática

Fórmulas trigonométricas úteis

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

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

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

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

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

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

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

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

Fórmulas hiperbólicas úteis

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

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

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

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

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

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

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