Universidade do Minho
Departamento de Matemática

LEInf

# Cálculo para Engenharia

Formulário 1 — 2022'23

Omite-se o domínio das funções.

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

$$1 + \operatorname{tg}^2 x = \frac{1}{\cos^2 x}$$

$$1 + \operatorname{cotg}^2 x = \frac{1}{\operatorname{sen}^2 x}$$

$$\operatorname{sen}(-x) = -\operatorname{sen} x \quad \text{(a função é ímpar)}$$

$$\cos(-x) = \cos x \quad \text{(a função é par)}$$

$$\operatorname{sen}(x+y) = \operatorname{sen} x \cos y + \operatorname{sen} y \cos x$$

$$\cos(x+y) = \cos x \cos y - \operatorname{sen} y \operatorname{sen} x$$

$$\operatorname{sen} x - \operatorname{sen} y = 2 \operatorname{sen} \tfrac{x-y}{2} \cos \tfrac{x+y}{2}$$

$$\cos x - \cos y = -2 \operatorname{sen} \tfrac{x-y}{2} \operatorname{sen} \tfrac{x+y}{2}$$

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

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

$$\operatorname{sen}(\arccos x) = \sqrt{1 - x^2}$$

$$\operatorname{tg}(\arccos x) = \frac{\sqrt{1 - x^2}}{x}$$

$$\operatorname{senh} x = \frac{e^x - e^{-x}}{2}$$

$$\cosh x = \frac{e^x + e^{-x}}{2}$$

$$\cosh^2 x - \operatorname{senh}^2 x = 1$$

$$\cosh x + \operatorname{senh} x = e^x$$

$$\tanh^2 x + \frac{1}{\cosh^2 x} = 1$$

$$\operatorname{cotanh}^2 x - \frac{1}{\operatorname{senh}^2 x} = 1$$

$$\operatorname{senh}(-x) = -\operatorname{senh} x \quad \text{(a função é ímpar)}$$

$$\cosh(-x) = \cosh x \quad \text{(a função é par)}$$

$$\operatorname{senh}(x+y) = \operatorname{senh} x \cosh y + \operatorname{senh} y \cosh x$$

$$\cosh(x+y) = \cosh x \cosh y + \operatorname{senh} y \operatorname{senh} x$$

$$\cos(\operatorname{arcsen} x) = \sqrt{1 - x^2}$$

$$\operatorname{tg}(\operatorname{arcsen} x) = \frac{x}{\sqrt{1 - x^2}}$$

| $x$ | 0 | $\frac{\pi}{6}$ | $\frac{\pi}{4}$ | $\frac{\pi}{3}$ | $\frac{\pi}{2}$ |
|---|---|---|---|---|---|
| $\operatorname{sen} x$ | 0 | $\frac{1}{2}$ | $\frac{\sqrt{2}}{2}$ | $\frac{\sqrt{3}}{2}$ | 1 |
| $\cos x$ | 1 | $\frac{\sqrt{3}}{2}$ | $\frac{\sqrt{2}}{2}$ | $\frac{1}{2}$ | 0 |