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$$\cos z = \frac{e^{iz} + e^{-iz}}{2} = \dots = \sum_{n=0}^{\infty} \frac{z^{2n}}{(2n)!}, \quad z \in \mathbb{C}$$

$$\cos z \in \mathbb{R} \quad \text{de } z \in \mathbb{R}$$

$$\sin\left(z + \frac{\pi}{2}\right) = \cos z$$

$$\cos 0 = 1$$

$$\cos 2 = \underbrace{1 - \frac{2^2}{2!} + \frac{2^4}{4!}}_{1 - 2 + \frac{16}{24} = \frac{1}{3}} + \underbrace{\left(-\frac{2^6}{6!} + \frac{2^8}{8!}\right)}_{< 0} + \underbrace{\left(-\frac{2^{10}}{10!} + \frac{2^{12}}{12!}\right)}_{< 0} + \dots < \frac{1}{3}$$

$$\Rightarrow \cos > 0 \quad \text{ne } \left(0, \frac{\pi}{2}\right)$$

$$\sin 0 = 0, \quad \sin' = \cos > 0 \quad \text{ne } \left(0, \frac{\pi}{2}\right)$$

$$\rightarrow \sin > 0 \quad \text{ne } \left(0, \frac{\pi}{2}\right)$$

