

$$\cosh^{-1}(0) =$$

$$\log(0 \pm 0 - 1)^{\frac{1}{2}} = \log((-1)^{\frac{1}{2}}) = \log(\pm i)$$

$$= \begin{cases} \ln 1 + i\left(\frac{\pi}{2} + 2n\pi\right), n \in \mathbb{Z} \\ \ln 1 + i\left(-\frac{\pi}{2} + 2m\pi\right), m \in \mathbb{Z} \end{cases}$$

$$= \begin{cases} i\left(\frac{\pi}{2} + 2n\pi\right) \\ i\left(-\frac{\pi}{2} + \pi - \pi + 2m\pi\right) \end{cases}$$

$$= \begin{cases} i\left(\frac{\pi}{2} + \underbrace{2n\pi}_{\text{جزء}}$$

$$= i\left(\frac{\pi}{2} + k\pi\right), k \in \mathbb{Z}$$