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Demostrar que si un sistema opera a 16% de overshot $\zeta = 0,504$.

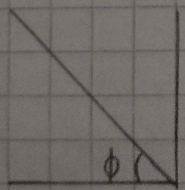
Tenemos: $\frac{05\%}{100} = e^{-\zeta\pi/\sqrt{1-\zeta^2}}$

$$0,16 = e^{-\zeta\pi/\sqrt{1-\zeta^2}} \longrightarrow \ln 0,16 = \frac{-\zeta\pi}{\sqrt{1-\zeta^2}} \longrightarrow \sqrt{1-\zeta^2} = \frac{-\zeta\pi}{\ln 0,16}$$

$$1-\zeta^2 = \frac{(\zeta\pi)^2}{\ln^2(0,16)} \rightarrow 1 = \zeta^2 + \zeta^2\left(\frac{\pi^2}{\ln^2(0,16)}\right) \longrightarrow \zeta^2\left(1 + \frac{\pi^2}{\ln^2(0,16)}\right) = 1$$

$$\zeta^2 = \frac{1}{1 + \frac{\pi^2}{\ln^2(0,16)}} \longrightarrow \zeta = \frac{1}{\sqrt{1 + \frac{\pi^2}{\ln^2(0,16)}}} \rightarrow \underline{\zeta = 0,503868}$$

Por ende:



$$\underline{\cos\phi = 0,5038}$$