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Given:

$$\cos^{-1} x + \cos^{-1} y + \cos^{-1} z = 0 \quad \text{with } x, y, z \in [-1, 1]$$

Step 1: Analyze range of $\cos^{-1} \theta$

For any $t \in [-1, 1]$,

$$\cos^{-1} t \in [0, \pi]$$

So sum of three such values is ≥ 0. The only way the total sum equals zero is when:

$$\cos^{-1} x = \cos^{-1} y = \cos^{-1} z = 0 \Rightarrow x = y = z = \cos(0) = 1$$

Step 2: Add values

$$x + y + z = 1 + 1 + 1 = \boxed{3}$$