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$$0 = (i-1)z^4 - (1+i) \Rightarrow \sqrt{2} \operatorname{cis} 135 - \sqrt{2} \operatorname{cis} 45$$

$$z^4 = \frac{\sqrt{2} \operatorname{cis} 45}{\sqrt{2} \operatorname{cis} 135} = \operatorname{cis}(-90) = -i = \operatorname{cis} 270 = \operatorname{cis}\left(\frac{3\pi}{2}\right)$$

$$z_k = \operatorname{cis}\left(\frac{3\pi}{8} + \frac{\pi k}{2}\right) \quad k=0,1,2,3$$

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$$\frac{1}{(\cos \alpha + i \sin \alpha)^k} = \frac{1}{(\operatorname{cis} \alpha)^k} = \frac{1}{\operatorname{cis}(\alpha k)} = \frac{\operatorname{cis} 0}{\operatorname{cis}(\alpha k)} = \operatorname{cis}(-\alpha k) =$$

$$\cos(-\alpha k) + i \sin(-\alpha k) = \cos(\alpha k) - i \sin(\alpha k)$$