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$$\sqrt[m]{k} = z \iff k = z^m \quad (*)$$

$k = t(\cos\beta + i\,\mathrm{sen}\,\beta)$

→ $z = r(\cos\alpha + i\,\mathrm{sen}\,\alpha)$

$(*)\quad t(\cos\beta + i\,\mathrm{sen}\,\beta) = [r(\cos\alpha + i\,\mathrm{sen}\,\alpha)]^m$

$$t(\cos\beta + i\,\mathrm{sen}\,\beta) = r^m(\cos m\alpha + i\,\mathrm{sen}\,m\alpha)$$

$$\begin{cases} t = r^m \Rightarrow r = \sqrt[m]{t} = t^{1/m} \\ m\alpha = \beta + 2\pi k \quad \alpha = \dfrac{\beta + 2\pi k}{m} \quad k \in \mathbb{Z} \end{cases}$$

$$z = \sqrt[m]{t}\cdot\left(\cos\frac{\beta + 2\pi k}{m} + i\,\mathrm{sen}\,\frac{\beta + 2\pi k}{m}\right)$$

$\sqrt[4]{-4}$ $\quad t = 4 \quad \beta = \pi$

$\downarrow$

$4(-1) = 4(\cos\pi + i\,\mathrm{sen}\,\pi)$

$\sqrt[4]{4} = \sqrt[2]{2} = 2^{1/2}$

$$\sqrt[4]{-4} = \sqrt[4]{-1}\cdot\underbrace{\sqrt[4]{4}}_{\sqrt{2}}$$

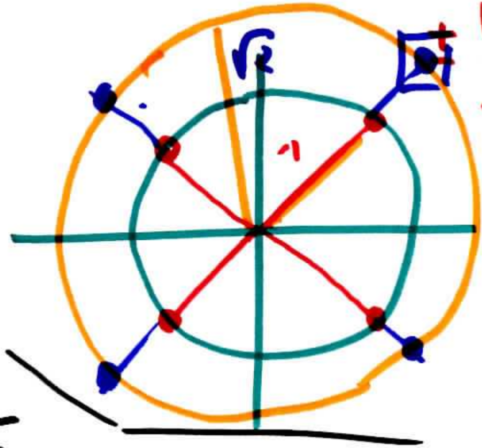
$k=0 \quad u_1 = \sqrt{2}\cdot\left(\cos\frac{\pi + 0}{4} + i\,\mathrm{sen}\,\frac{\pi}{4}\right) = \sqrt{2}\left(\frac{\sqrt{2}}{2} + i\frac{\sqrt{2}}{2}\right)$

$k=1 \quad u_2 = \sqrt{2}\left(\cos\frac{\pi + 2\pi}{4} + i\,\mathrm{sen}\,\frac{3}{4}\pi\right) = \sqrt{2}\left(-\frac{\sqrt{2}}{2} + i\frac{\sqrt{2}}{2}\right)$

$k=2 \quad u_3 = \sqrt{2}\left(\cos\frac{\pi + 4\pi}{4} + i\,\mathrm{sen}\,\frac{5}{4}\pi\right) = \sqrt{2}\left(-\frac{\sqrt{2}}{2} + i\left(-\frac{\sqrt{2}}{2}\right)\right)$

$k=3 \quad u_4 = \sqrt{2}\left(\cos\frac{\pi + 6\pi}{4} + i\,\sin\frac{7}{4}\pi\right) = \sqrt{2}\left(\frac{\sqrt{2}}{2} - i\frac{\sqrt{2}}{2}\right)$

$k=4 \quad u_5 = \sqrt{2}\left(\cos\frac{\pi + 8\pi}{4} + i\,\sin\frac{9}{4}\pi\right) = \sqrt{2} \ldots \equiv u_1$



$\frac{\sqrt{2}}{2}$

$\frac{2\pi}{m=4} = \frac{\pi}{4}$

$u_1 = 1 + i \quad |u_1| = \sqrt{2}$

$u_2 = -1 + i$

$u_3 = -1 - i$

$u_4 = +1 - i$

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