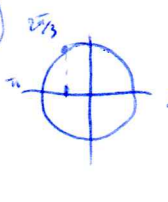


6

$\sqrt[3]{1}$



$$\left(-\frac{1}{2} + i\frac{\sqrt{3}}{2}\right)^{2019} = e^{i \frac{2\pi}{3} \cdot 2019}$$

$$= e^{i 2\pi \cdot 673} = e^{i 0} = \underline{1}$$

$$\begin{array}{r} 2019 \quad | \quad 3 \\ -18 \quad | \quad 673 \\ \hline -21 \quad | \\ \hline -29 \quad | \\ \hline 3 \end{array}$$

$$\left(-\frac{1}{2} + i\frac{\sqrt{3}}{2}\right)^{2020} = e^{i \frac{2\pi}{3} \cdot 2020}$$

$$= e^{i \frac{2\pi}{3} \cdot (3 \cdot 673 + 1)} = e^{i 2\pi \cdot 673 + i \frac{2\pi}{3}}$$

$$= e^{i \frac{2\pi}{3}}$$

$$\begin{array}{r} 2020 \quad | \quad 3 \\ 22 \quad | \quad 673 \\ \hline 10 \quad | \\ \hline 1 \end{array}$$

$$2020 = 3 \times 673 + 1$$

$$1 - i\sqrt{3} = 2 \left(\frac{1}{2} - i\frac{\sqrt{3}}{2}\right) = 2 e^{-i \frac{\pi}{3}}$$

$$1 - i = \sqrt{2} \left(\frac{\sqrt{2}}{2} - i\frac{\sqrt{2}}{2}\right) = \sqrt{2} e^{-i \frac{\pi}{4}}$$

$$\frac{1 - i\sqrt{3}}{1 - i} = \frac{2 e^{-i \frac{\pi}{3}}}{\sqrt{2} e^{-i \frac{\pi}{4}}} = \sqrt{2} e^{-i \frac{\pi}{3} + i \frac{\pi}{4}} = \sqrt{2} e^{-i \frac{\pi}{12}}$$

$$\left(\frac{1 - i\sqrt{3}}{1 - i}\right)^{30} = \sqrt{2} e^{-i \frac{\pi}{12} \cdot 30} = \sqrt{2} e^{-i \frac{5\pi}{2}} = \sqrt{2} e^{-i \frac{5\pi}{2} + 2\pi} = \sqrt{2} e^{-i \frac{\pi}{2}} = \underline{-\sqrt{2}i}$$