the Cubic root of unity

$1, \ -\frac{1}{2} + \frac{\sqrt{3}}{2} i, \ -\frac{1}{2} - \frac{\sqrt{3}}{2} i$

$1, \quad \omega \quad , \quad \omega^2$

ω^2 is the conjugate of ω

$\omega^3 = 1$

- simplify ω (greatest)
- ω in the deno تطلع ω^2 in the numerator
- ω^2 in the deno تطلع ω in the numerator
- the sticker

$1 + \omega + \omega^2 = $ Zero

an two have the same sign
the third with diff sign

$\begin{matrix} \omega - \omega^2 \\ \omega^2 - \omega \end{matrix} = \pm \sqrt{3} i$ the last result.

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solve $z^3 = 1$ in "C"

Solution

$\frac{a+5}{\omega} = \frac{1(a+5)}{\omega} = \_\_\_\_\_\_$

$\frac{K}{\omega^2} =$

$\frac{a + b\omega}{a\omega^2 + b} = \_\_\_\_\_\_ = \_\_\_\_\_\_ =$

$\frac{3\omega^2 - 5}{3 - 5\omega} = \_\_\_\_\_\_ = \_\_\_\_\_\_ =$

$\frac{a - 3\omega}{a\omega^2 - 3} = \_\_\_\_\_\_ = \_\_\_\_\_\_ =$

$\frac{5}{w^5} = \frac{5}{} =$

$\frac{3}{w^7} = \frac{}{} =$

$\frac{5-w}{5w^2-1} = \frac{}{} = \frac{}{}$

$w + w^2 =$

$1 + w =$

$1 + w^2 =$

$-1 - w =$

$-1 - w^2 =$

$-w - w^2 =$

$3 + 3w =$

$3w^2 + 3 =$

$5w^2 + 5w =$

$-2w^2 - 2 =$

$iw + iw^2 =$

$aw^2 + a =$

$1 + 3w + 3w^2 =$

$5 - 2w - 2w^2 =$

$3 + 2w + 3w^2 =$

$5 + 5w - 2w^2 =$

$4 + 3w + 2w^2 =$

$=$

$3 - w - 4w^2 =$

$=$

$\frac{3}{w^6} - \frac{2}{w^7} - \frac{2}{w^8} =$

$=$

$=$

Simplify $\left(\frac{x+y\omega}{x\omega^2+y} - \frac{a\omega^2+b}{a+b\omega}\right)^4$

Solution

$$\left(\underline{\qquad\qquad\qquad} - \underline{\qquad\qquad\qquad}\right)^4$$

$$\left(\underline{\qquad\qquad\qquad} - \underline{\qquad\qquad\qquad}\right)^4$$

Prove that $\left(\frac{a+\omega b+\omega^2 c}{\omega^2 a+b+b\omega} - \frac{c+a\omega^2+b\omega}{c\omega+b\omega^2+a}\right)^8 = 81$

Solution

$$\left(\underline{\qquad\qquad\qquad} - \underline{\qquad\qquad\qquad}\right)^8$$

$$\left(\underline{\qquad\qquad\qquad} - \underline{\qquad\qquad\qquad}\right)^8$$

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find $\left[\frac{1}{1+3\omega^2} - \frac{1}{1+3\omega}\right]^2$

Solution

Prove that $\left(\frac{\omega}{1+2\omega}\right)^2 + \left(\frac{1+2\omega^2}{\omega^2}\right)^2 = \frac{-10}{3}\omega^2$

Solution