$\Rightarrow \sqrt{2i} = \sqrt{1^2 - 1^2 + 2\cdot 1 \cdot 1\, i}$

$= \sqrt{1^2 + i^2 + 2i}$

$\Rightarrow \sqrt{2i} \qquad \sqrt{2i} = \sqrt{(1+i)^2}$

$\Rightarrow \quad \sqrt{2i} = \pm (1+i)$

$\Rightarrow \therefore$ for $\sqrt{i} = \pm \dfrac{(1+i)}{\sqrt{2}}$

⊙ CUBE ROOTS OF UNITY

$z^3 = 1 \quad \Rightarrow z^3 - 1 = 0 \quad \Rightarrow (z-1)(z^2+z+1) = 0$

$\therefore \quad z = 1, \ \dfrac{-1 \pm \sqrt{3}i}{2} \quad$ i.e $\ 1, \omega, \omega^2$

$\omega \rightarrow$ +ve radical $\qquad \omega^2 \rightarrow$ −ve radical

$\rightarrow \omega^3 = 1 \qquad 1 + \omega + \omega^2 = 0$

⊙ $y = x^{x^{x^{\cdots \infty}}}$ $\qquad$ Iterative functions $\downarrow$ repeat

$\Rightarrow y = x^y$

→ In any no $(a+ib)$, if $a:b = \sqrt{3}:1$ or $1:\sqrt{3}$ then it can always be expressed in terms of $\omega/\omega^2$.

⊙ CONJUGATE

$(x+iy) \rightarrow (x-iy)$