$|a|-|b| \le |a-b|$

y $\quad x \quad$ $y-x$.

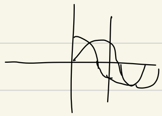
Solve $z^5 = 1+i$

$= \sqrt{2}\left(\frac{1}{\sqrt{2}}+\frac{i}{\sqrt{2}}\right)$

$= \sqrt{2}\left(\cos\frac{\pi}{4}+i\sin\frac{\pi}{4}\right)$.

$= \sqrt{2}\, e^{(\frac{\pi}{4}+2\pi k)i}$

$z = 2^{\frac{1}{10}} e^{\frac{1}{5}i(\frac{\pi}{4}+2\pi k)}$ $\quad k=0,1,\dots,4$



Solve $z^4 = 1-\sqrt{3}\,i$

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

$= 2\left(\cos\frac{5}{3}\pi - i\sin\frac{5}{3}\pi\right)$

$= 2\cdot e^{(\frac{5}{3}\pi+2\pi k)i}$

$z = 2^{\frac{1}{4}}\cdot e^{\frac{1}{4}(\frac{5}{3}\pi+2\pi k)i}$ $\quad k=0,1,2,3$.

$f(z) = z+2z^2 \Rightarrow \lim_{z\to i} f(z) = i-2$

$1 \quad i$

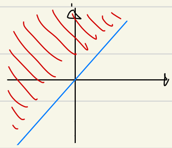
$2 \quad -2i-1$

if $\forall\varepsilon \ge 0,\ \exists\,\delta$

s.t $|z-i|<\delta \Rightarrow |z+2z^2-i+2| < \varepsilon$

$|z+i||2z-(2i+1)| \le |z+i|(|z|+5) <$

$A = \{z = x+iy \mid x<y\}$ open 임을 보여라



Let $z\in A$ and $z = x+yi$, $y-x>0$.

$\delta = \frac{1}{\sqrt{2}}(y-x) > 0 \to \sqrt{2}\,\delta = y-x$. $\quad \sqrt{2}|z-w| < \sqrt{2}\delta$

if $w\in B_\delta(z)$ then $|z-w|<\delta$, $w = a+bi$

$|Im(z-w)| - |Re(z-w)| \le |z-w| \le \sqrt{2}|z-w| < \sqrt{2}\delta$ $= y-x$.

$(y-b)-(x-a) = Im(z-w) - Re(z-w) < y-x$.

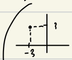
$\therefore\ b-a>0$.

$\therefore\ w\in A$

A is open.

* $\log(-3+3i) = ?$

$\log(-3+3i) = \ln|-3+3i| + i\arg(-3+3i)$



$= \ln 18 + i\frac{3}{4}\pi$.

$i^{i+1} = e^{(i+1)\log i}$

$= e^{(i+1)(\ln|i|+i\arg(i))}$ $\quad \arg(i) \to = \frac{\pi}{2}+2n\pi$.

$= e^{(i+1)\frac{\pi}{2}}$.