

W5D1

01/04/2012

2123-77

$$e^z = e^x (\cos y + i \sin y) \quad \text{1) 2) 3) 7}$$

$x = \operatorname{Re} z, \quad y = \operatorname{Im} z$

$$e^{z_1 + z_2} = e^{z_1} e^{z_2}$$

$$e^{2\pi i} = 1$$

$$(e^z)' = e^z$$

$$e^g = z$$

$$g = \ln |z| + i \arg z$$

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$\arg z \in (-\pi, \pi)$

$\arg z = \log z$

$$e^g = f, \quad f \neq 0, \quad f \in A(G)$$

$$g = \ln f$$

$z \in G_1 \subset G$

$g \in A(G_1)$

$e^{g(z)} = f(z)$

$z_0 \in G$

$g \in A(G)$

$e^{g(z)} = f(z)$

$$g'(z) = \frac{f'(z)}{f(z)}$$

$\frac{f'(z)}{f(z)} \in A(G)$

$$g = f$$

$$g' = f \quad \text{ok}$$

$f^{1/n}$ $f^{1/2}$ f g d_{11} $r-p$ nk n
 $f^{1/n}$ f nk n $r-p$ $g-2$ nk

$$g_1, wg_1, \dots, w^{n-1}g_1$$

$$w = e^{\frac{2\pi i}{n}}$$

$f^{1/2}$ (c) 2015 G. G. 12

$$h(z) = \frac{g_1(z)}{g_2(z)} \in C^1(G)$$

$$h^n(z) = 1$$

$$h(z) \in \{1, \omega, \omega^2, \dots, \omega^{n-1}\}$$

$\forall z \in \omega^k$

$$f_n' \log f \in \mathcal{D}_S \Rightarrow G \rightarrow \infty \text{ or } (2)$$

$$g'/g = \frac{1}{n} \frac{f'}{f} \quad \Rightarrow \quad g = f^{\frac{1}{n}} \quad (3)$$

$f \in A(G)$, $\text{Im } f \neq \emptyset$
 $(\text{for } f \in A(G))$ $f^{-1} = \{ \}$
 $\text{for } f \in A(G)$

$$\text{for } f \in A(G) \quad \text{Im } f = U \cap \{ \}$$

$$f^{-1}: U \rightarrow G \quad (2)$$

$$f^{-1} \in C(U)$$

$$f^{-1} \in A(U)$$

for $f \in A$

$$f = \arccos(z)$$

$$\cos(w) = z$$

$$\frac{e^{iw} + e^{-iw}}{2} = z$$

$$\zeta = e^{iw}$$

$$\Rightarrow \zeta + \frac{1}{\zeta} = 2z$$

$$\zeta^2 - 2z\zeta + 1 = 0$$

$$\zeta = z \pm \sqrt{z^2 - 1}$$

$$w = \log(z \pm \sqrt{z^2 - 1})$$

$$w = iy$$

$$\cos w = \frac{e^{-y} + e^y}{2} = 1$$

$$\rightarrow \arccos \in C \setminus \{ \} \cup (-\infty; 1] \cup [1; \infty)$$