iii) $f(z)$ not one to one (7)
because

$$f\left(\tfrac{1}{2}\pi + i\left(1-\tfrac{1}{2}\pi\right)\right) = f\left(\tfrac{5\pi}{2} + i\left(1-\tfrac{1}{2}\pi\right)\right)$$

$\therefore f(z)$ has no inverse.

iv) $g(z) = \mathrm{Log}(1+iz) = y$

Log has inverse, exp

$\therefore 1 + iz = e^{y}$

$$z = \frac{e^{y}-1}{i}$$

$$g^{-1}(z) = \frac{e^{z}-1}{i}$$

Domain is $\mathbb{C}$