

You've correctly noted that  $f(t)$  lies in  $\mathbb{C}_{2\pi}$   
 so that one choice of continuous argument function  
 for  $\Gamma$  is  $\text{Arg}_{2\pi}(f(t))$

Hence

$$\begin{aligned} \text{Wind}(\Gamma, 0) &= \frac{1}{2\pi} \{ \text{Arg}_{2\pi}(3-3i) - \text{Arg}_{2\pi}(-1-i) \} \\ &= \frac{1}{2\pi} \left\{ \frac{7\pi}{4} - \frac{5\pi}{4} \right\} \\ &= \frac{1}{4} \end{aligned}$$