

Quiz 3 MATH 1199 Fall 2019

$$\int_C \bar{z} dz, \quad C: \begin{cases} z(t) = 2e^{it} \\ -\frac{\pi}{2} \leq t \leq \frac{\pi}{2} \end{cases}$$

Soln: $f(z) = \bar{z} \rightarrow f(z(t)) = \overline{z(t)} = \overline{2e^{it}} = 2e^{-it}$
 $z'(t) = 2ie^{it}$

$$\int_C \bar{z} dz = \int_{-\pi/2}^{\pi/2} f(z(t)) z'(t) dt$$
$$= \int_{-\pi/2}^{\pi/2} (2e^{-it})(2ie^{it}) dt$$

$$= 4i \int_{-\pi/2}^{\pi/2} 1 dt$$

$$= 4i \left[\frac{\pi}{2} - \left(-\frac{\pi}{2}\right) \right]$$

$$= 4\pi i$$