MATH 633(HOMEWORK 2)

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Exercise. (Problem 3)

$$\begin{aligned}\int_a^b |z'(t)|dt &= \int_c^d |z'(t(s))|t'(s)ds \\ &= \int_c^d |z'(t(s))t'(s)|ds \\ &= \int_c^d |\tilde{z}'(s)|ds\end{aligned}$$

where $\tilde{z}(s) : [c, d] \to \mathbb{C}$ is a reparametrization of $z(t) : [a, b] \to \mathbb{C}$.