

Note on integration along the γ curve

Let f be a function continuous on the directed smooth curve γ . Then if $z = z(t)$, $a \leq t \leq b$, is any admissible parametrization of γ consistent with its direction, we have

$$\int_{\gamma} f(z) dz = \int_a^b f(z(t))z'(t) dt \quad (1)$$

because

$$\frac{dz}{dt} = z'(t) \quad (2)$$

$$dz = z'(t)dt \quad (3)$$

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