

1. Provide an explicit definition for the function element

$$f(x) = z^{1/3}(1 - z)^{1/2}$$

in a neighborhood of $z = 1/2$.

2. Study the analytic continuation of f along paths in $\mathbb{C} \setminus \{0, 1\}$. In particular, what happens when a path winds around $z = 0$, $z = 1$?
3. Prove that f defines an algebraic function, and determine the polynomial $P(t_1, t_2)$ such that

$$P(f(z), z) = 0.$$