The mappings \( \text{CM} \) form a group \( \text{a quotient of } \text{GL}_2(P) \), by the appropriate homogeneity, the group of linear fractional transformations \( \text{LF}(\mathbb{C}) \).

Some nice facts about \( \text{LF}(\mathbb{C}) \) should be recorded.

1. \( \text{We use some language in Remmert (pp. 88-89).} \)

   Suppose \( G \) is a subgroup of automorphisms of a set \( S \).

   \( S \) is homogeneous with respect to \( G \) if, \( \forall \, s, \tilde{s} \in S \),

   \( \exists \, g \in G \, \text{with } g(s) = \tilde{s} \).

**Lemma:** If \( \exists \, c \in S \) with the orbit of \( c \) under \( G \)

(\text{that is } \{ s \in S : \exists \, g \in G \, \text{with } s = g(c) \} \) being all of \( S \),

then \( S \) is homogeneous.

**Proof:** Given \( s, \tilde{s} \in S \), \( \exists \, g \& \tilde{g} \) with \( s = g(c) \) and

\( \tilde{s} = \tilde{g}(c) \). Then \( \tilde{g} \circ g(s) = \tilde{s} \), so \( \exists \, g \, \text{in homogeneous,} \)

\( G \) is also said to act transitively on \( S \). \( \text{LF}(\mathbb{C}) \)

acts transitively on \( \text{CP}^1 \). Indeed, much more is true:

**Prop.** \( \text{LF}(\mathbb{C}) \) acts freely transitively on \( \text{CP}^1 \).

That is, given \( w_1, w_2, w_3 \) (all distinct) and \( z_1, z_2, z_3 \) (all distinct) \( \exists \, [w] \) with \( [w]w_j = z_j \), \( (j \neq 3) \).