Also, we consider the functional equation of the form

$$f(qz) = \frac{1}{z} f(z),\ z \in \mathbb{C}^*. \tag{3}$$

Definition. *[1] The function*

$$P(z) = (1-z)\prod_{n=1}^{\infty}(1-q^n z)\left(1-\frac{q^n}{z}\right)$$

is called the **Schottky-Klein prime function.**

Theorem 2. *Every holomorphic in $\mathbb{C}^*$ solution of (3) has the form $f(z) = CP(-z)$, where C is a constant.*

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Category of ambiguous representations

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It is well known since the pioneering work [1] that a computer program is described by the corresponding *predicate transformer*, i.e. the mapping that transforms a valid knowledge about program input into a valid knowledge about the output. It is also commonly agreed [3] that the proper domains containing such predicates are directed complete continuous posets, and the predicate transformers are Scott continuous. Hence a viable choice for description of *deterministic* programs is the category $\mathcal{S}\mathrm{em}_0$ of all continuous semigroups [2] with bottom elements and their Scott continuous bottom-preserving (not necessarily meet-preserving) mappings.

Unfortunately this category is inappropriate for *nondeterministic* programs, or, equivalently, for game situations, where a player can play different moves in the same position. We propose to use a relation (= a multivalued mapping) here:

Definition 1. *Let S_1, S_2 be continuous semilattices with zeros 0_1 and 0_2 resp. An ambiguous representation of S_1 in S_2 is a binary relation $R \subset S_1 \times S_2$ such that*

(a) if $(x, y) \in R$, $x \leqslant x'$ in S_1, and $y' \leqslant y$ in S_2, then $(x', y') \in R$ as well;

(b) for all $x \in S_1$ the set $xR = \{y \in S_2 \mid (x, y) \in R\}$ is non-empty and Scott closed in S_2.

If xRy, then we say that $y \in S_2$ represents $x \in S_1$.

Idea: if $x \in S_1$ holds, then we can (but not obliged) ensure $y \in S_2$.

Hence we construct a category with the continuous semilattices with zeros as the objects and ambiguous representations as arrows. The key problem is to define compositions.

A straightforward attempt to define the composition of $R \subset S_1 \times S_2$, $Q \subset S_2 \times S_3$ as $RQ = \{(x, z) \in S_1 \times S_3 \mid \text{there is } y \in S_2 \text{ such that } (x, y) \in R, (y, z) \in Q\}$, fails because closedness of xRQ in the condition (b) of the definition of ambiguous representation does not always holds.

If we take closures of the values of the corresponding mutivalued mapping $R;Q = \{(x, z) \in S_1 \times S_3 \mid z \in \mathrm{Cl}(xRQ)\}$, then closedness is at hand, but associativity fails!

Based on [4] we shall present a subclass of all ambiguous representations which we called *pseudo-invertible*. Composition of pseudo-invertible representations turned out to be associative, and a new category containing $\mathcal{S}\mathrm{em}_0$ as a subcategory is obtained.

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Entire Dirichlet series with monotonous coefficients and logarithmic h-measure

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