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On number of commutative mappings from finite set into itself (Preliminary
communication)

ON NUMBER OF COMMUTATIVE MAPPINGS FROM FINITE SET INTO ITSELF

(Preliminary communication)

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Let F be a system of mappings from a finite set X in-
to itself. Let the set X contain exactly n points, n a
natural number. Then, evidently, the system F cannot contain
more than n^n mappings.

Let us assume that every two mappings from F commute,
that is $f \circ g = g \circ f$ for every $f, g \in F$, where by o we
denote the composition of mappings. It can be proved that F
does not contain more than a(n) mappings, where

$$a(n) = 2^{n-1} \quad \text{for} \quad n = 1,2,\dots, 6,$$

$$a(n) = \max_{r=2,\dots,n-3} (n-r)^r + 1 \quad \text{for } n \geq 7 .$$

On the other hand, there exists a commutative system G
of mappings from X into X , such that G contains a(n)
mappings.

The proof of this assertion will be published in the
Czech. Math. Journal.