

COMPLICATED TERNARY BOOLEAN OPERATIONS

MICHAEL PINSKER

It is well-known that the binary operations on any base set X generate all finitary operations on X . Call a finitary operation on a cardinal $\kappa \geq 2$ *boolean* if it takes only values in $\{0, 1\}$. We show that the clone of all boolean operations on infinite κ contains a very “complicated” ternary operation, in the sense that it is not generated by binary boolean operations. This yields the following statement about boolean operations on finite sets: For all $k \geq 1$ there exist $n \geq 2$ and a ternary boolean operation f on n such that f is not a term of k binary boolean operations on n .

DEPARTMENT OF MATHEMATICS, HITOTSUBASHI UNIVERSITY, NAKA 2-1, KUNITACHI,
TOKYO 186-8601, JAPAN

E-mail address: `marula@gmx.at`