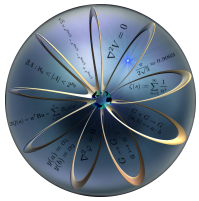

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mapping of period n is a bijection

Canonical name	MappingOfPeriodNIsABijection
Date of creation	2013-03-22 13:48:57
Last modified on	2013-03-22 13:48:57
Owner	Koro (127)
Last modified by	Koro (127)
Numerical id	7
Author	Koro (127)
Entry type	Proof
Classification	msc 03E20

Theorem Suppose X is a set. Then a mapping $f : X \to X$ http://planetmath.org/PeriodOf period n is a bijection.

Proof. If $n = 1$, the claim is trivial; f is the identity mapping. Suppose $n = 2, 3, \ldots$. Then for any $x \in X$, we have $x = f\big(f^{n-1}(x)\big)$, so f is an surjection. To see that f is a injection, suppose $f(x) = f(y)$ for some x, y in X. Since f^n is the identity, it follows that $x = y$. $\square$