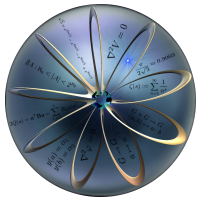

planetmath.org

Math for the people, by the people.

product representations of Jacobi ϑ functions

Canonical name	ProductRepresentationsOfJacobivarthetaFunctions
Date of creation	2013-03-22 14:52:13
Last modified on	2013-03-22 14:52:13
Owner	rspuzio (6075)
Last modified by	rspuzio (6075)
Numerical id	4
Author	rspuzio (6075)
Entry type	Theorem
Classification	msc 33E05

The Jacobi theta functions can be expressed as infinite products:

$$\vartheta_1(z;q) = 2q^{1/4}\sin z\prod_{n=1}^{\infty}(1-q^{2n})(1-2q^{2n}\cos 2z+q^{4n})$$

$$\vartheta_2(z;q) = 2q^{1/4}\cos z\prod_{n=1}^{\infty}(1-q^{2n})(1+2q^{2n}\cos 2z+q^{4n})$$

$$\vartheta_3(z;q) = \prod_{n=1}^{\infty}(1-q^{2n})(1+2q^{2n-1}\cos 2z+q^{4n-2})$$

$$\vartheta_4(z;q) = \prod_{n=1}^{\infty}(1-q^{2n})(1-2q^{2n-1}\cos 2z+q^{4n-2})$$