1051-83-108 **Jennie D'Ambroise*** (`dambroise@math.umass.edu`), P.O. Box 192, Amherst, MA 01004.
Elliptic functions in cosmology.

In general, Einstein's gravitational field equations of the theory of general relativity cannot be solved exactly. One case in which exact solutions are possible is the Friedmann-Lemaître-Robertson-Walker (FLRW) model, in which one assumes that on large scales our current universe is homogeneous and isotropic. We will show that the resulting equations have solutions in terms of elliptic functions, which are the simplest of non-elementary functions and are known to appear in many branches of physics. In particular we will write these solutions in terms of Jacobi or Weierstrass elliptic functions, and in some cases also show an equivalent expression in terms of theta functions. (Received August 20, 2009)