California State University
Northridge

Department of
Mathematics

Problem of the Week

Proposed by Bernardo Ábrego and Silvia Fernández

November 10-17

The *void cube* is a solid obtained by drilling square-shaped holes, all the way through, in each of the faces of a cube. (Figure 1.)

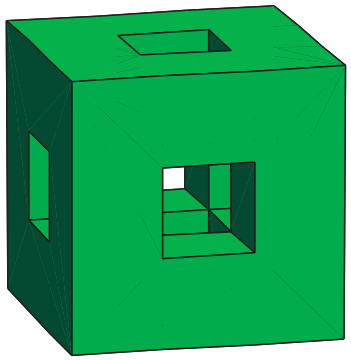

Figure 1.

It is known that the surface of the void cube can be bijectively and continuosly deformed to an n-fold torus. Figure 2 shows a 2-fold torus and a 4-fold torus.

What is n? Justify your answer.

Figure 2.

This contest is sponsored by the Mathematics Department. Open to all CSUN students.
Winner gets $10 or an equivalent prize. All complete and correct solutions get a certificate.
Type and send your solution before November 17th, 9:00PM to silvia.fernandez@csun.edu.
All steps of the solution must be clearly justified.
For rules, winners, solutions, and more information visit: www.csun.edu/math/probweek