California State University Northridge

Department of Mathematics

Problem of the Week

Proposed by Bernardo Ábrego and Silvia Fernández

September 18-25

Let $A_1 = (1,2,3,4,5,6,\ldots)$ be the sequence of all natural numbers. Define A_{n+1} by adding one to all terms in A_n that are divisible by n. For example,
$A_2 = (2,3,4,5,6,7,8,9,\ldots)$ and $A_3 = (3,3,5,5,7,7,9,9,\ldots)$.
Find with proof all numbers n for which the first $n-1$ terms of A_n are all equal to n.

This contest is sponsored by the Mathematics Department. Open to all CSUN students.
Winner gets $5 or an equivalent prize. All complete and correct solutions get a certificate.
Type and send your solution before September 25th, 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**