ON THE PSEUDO-FROBENIUS NUMBERS OF NUMERICAL SEMIGROUPS

MANUEL DELGADO, PEDRO A. GARCÍA-SÁNCHEZ, AURELIANO M. ROBLES-PÉREZ

Let S be a numerical semigroup. An integer x is said to be the *Frobenius number* of S (respectively, a *pseudo-Frobenius* number of S) if $x \notin S$ and $x + s \in S$, for all $s \in \mathbb{N} \setminus \{0\}$ (respectively, for all $s \in S \setminus \{0\}$).

It is well known that, if f is a positive integer, then there exist numerical semigroups with Frobenius number equal to f. Moreover, there are algorithms to compute all numerical semigroups with a given Frobenius number.

Let PF be a set of n positive integers. Denote by $\mathcal{S}(PF)$ the set of numerical semigroups whose set of pseudo-Frobenius numbers is PF. This set is always finite but it may clearly be empty if $n > 1$. In this way, two questions arise naturally: find conditions on the set PF that ensure that $\mathcal{S}(PF) \neq \emptyset$ and find an algorithm to compute $\mathcal{S}(PF)$.

We present some theoretical results about the first question and two different procedures to determine the set of all numerical semigroups with a given set of pseudo-Frobenius numbers.

Date: February 10, 2015.