1129-03-258 **Victoria Gitman*** (vgitman@gmail.com). *Computable processes which produce any desired output in the right nonstandard model.*

A total computable function will produce the same output on the standard natural numbers regardless of which model of PA it is evaluated in. But a (partial) computable function can be the empty function in the standard model $\mathbb{N}$ and a total function in some nonstandard model. I will discuss some extreme instances of this phenomena, investigated recently by Woodin and Hamkins, showing that there are computable processes which produce any desired output by going to the right nonstandard model. Hamkins showed that there is a single TM program p with the property that given any function $f : \mathbb{N} \to \mathbb{N}$, there is a model $M_f \models \mathrm{PA}$ so that in M_f p computes f on the standard part. Even more drastically, Woodin has shown that there is a single index e, for which PA proves that W_e is finite, with the property that for any finite set s of natural numbers, there is a model $M_s \models \mathrm{PA}$ in which $W_e = s$. It follows for instance, by the MRDP theorem, that there is a single Diophantine equation $p(n, \bar{x}) = 0$, which PA proves has solutions for finitely many n, and given any finite set s, we can pass to a model in which $p(n, \bar{x}) = 0$ has a solution if and only if $n \in s$. (Received March 17, 2017)