



Bilkent University  
Department of Mathematics

## PROBLEM OF THE MONTH

**Term:** April 2008

The sequence  $\{x_n\}$  is defined by  $x_1 = a$ ,  $x_2 = b$  and  $x_n = 2008x_{n-1} - x_{n-2}$  for all  $n \geq 2$ . Prove that there are positive integers  $a$  and  $b$  such that for all  $n \geq 1$

$$1 + 2006x_nx_{n+1}$$

is a perfect square.