



Bilkent University
Department of Mathematics

PROBLEM OF THE MONTH

Term: January 2022

A pair (n, k) , where $n > k \geq 0$ are integers is said to be *strange* if for any $a \equiv k \pmod{n}$ and any positive integer m the expression

$$\frac{a^m + 3^m}{a^2 - 3a + 1}$$

is not integer. Find the smallest n such that (n, k) is strange for some k .