
**Bilkent University**
**Department of Mathematics**

# Problem Of The Month

**Term:** October 2021

A positive integer number $s$ is said to be *n-smooth* if $s = a_1^2 + a_2^2 + \cdots + a_n^2$, where each $a_i, i = 1, 2, \ldots, n$ is divisible by $n$. An integer number $s$ is said to be *n-rough* if $s = a_1^2 + a_2^2 + \cdots + a_n^2$, where each $a_i, i = 1, 2, \ldots, n$ *is not* divisible by $n$. Find all positive integers $n$ for which any n-smooth number is n-rough number.