| <b>Problem 1</b> : Let $k$ and $d$ be positive in- |  |
|--|--|
| tegers. Prove that there exists a positive         |  |
| integer $N$ such that for every odd integer        |  |
| n>N, the digits in the base- $2n$ represen-        |  |
| tation of $n^k$ are all greater than $d$ .         |  |
|  |  |
|  |  |

positive integers k such that  $1 \quad \sum_{n=1}^{n} (n)^{k}$ 

**Problem 5**: Determine, with proof, all

